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CORRECTION

Montana Wapasha Review, October 1944, vol.
72, page 216: Insert "August" at head of "Data"
column just above figures.

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PRELIMINARY REPORT ON TORNADOES IN THE UNITED STATES DURING 1944

By J. L. BALDWIN

[Weather Bureau, Washington, D. C.]

THE tabulations for 1944 as shown in table 1 were derived from data on "Severe Local Storms" appearing in the MONTHLY WEATHER REVIEW and in monthly CLIMATOLOGICAL DATA of the various sections of the United States. They show the approximate monthly and annual number of tornadoes and the deaths, injuries, and property damage caused by them in the several States and in the country as a whole. A final and more complete report will appear in the UNITED STATES METEOROLOGICAL YEARBOOK, 1944.

The total number of tornadoes reported during 1944 was 160, or 15 more than the average. Of these 45 occurred in April. This relatively large monthly number is due to the series of tornadoes that occurred in Kansas, Oklahoma, and adjoining areas about the 9th and 10th of that month. The month of greatest tornadic activity is generally May, when the usual number is about 31, or only 5 less than occurred this May. During the 3 months from April to June, 113, or seven-tenths of this year's total, were reported. Tornadoes appeared in 29 States, all east of the Rocky Mountains, except a mild, questionable tornado on November 11 in California. These storms were the most widespread in June when reported from 14 States, extending from Montana and Texas to Minnesota and Maryland. None were noted in December.

There were 273 deaths or 28 more than the average toll of these twisters; about 1,734 people were injured. Most of the deaths occurred during May and June, especially on the evening of June 23 when 153 lost their lives in southwestern Pennsylvania, northern West Virginia and Maryland. These areas were rather thinly settled, thus preventing a much greater loss of life. No deaths were attributed to approximately 26 tornadoes in Kansas and only 3 to about 29 of these storms in Iowa.

Property damage for the year was approximately \$16,827,600, which is about \$5,600,000 more than the usual destruction. More than three-fourths of this occurred in April and June, with none in December and practically none in October. About one-third of the total damage was caused by the Pennsylvania-West Virginia-Maryland tornadoes of June 23.

The most severe and destructive tornadoes of 1944 occurred in southwestern Pennsylvania, northern West Virginia, and Maryland on the evening of June 23. This intense tornadic activity was most unusual in that it persisted over rugged terrain, where storms of this severity rarely occur. Only 6 relatively mild tornadoes are on record as having ever occurred before in West Virginia. Pennsylvania averages about $1\frac{1}{2}$ tornadoes per year, and even here the closest similarity was on August 19, 1890 when 16 lives were lost as a tornado passed through Wilkes-Barre.

These tornadoes were associated with the rapid eastward movement of an active cold front over these areas.

A survey was made by the Weather Bureau Office, Pittsburgh, Pa., from which much of the following on these tornadoes has been extracted. Observers who witnessed the paths of the tornadoes from the air stated that there were some meanderings but the general direction was from northwest to southeast, and the paths looked as though huge rollers had flattened everything in their way. The four main paths were from northwest of Shinnston, W. Va., to the mountains southeast of Montrose, W. Va. (40 miles); vicinity of Wellsburg, W. Va., to mountains southeast of Deer Park, Md. (80 miles); Ravenna, Ohio, possibly to Cambridge, Md., but at widely separated points, with major damage from Pittsburgh to Somerset, Pa., over a distance of 50 miles; Rural Valley to Twin Rocks, Pa. (25 miles). These tornadoes apparently moved almost simultaneously at 30 to 40 miles per hour along nearly parallel paths between 6:30 and 9:30 p. m., on June 23, dissipating on reaching the high range of the Alleghenies. Local tornadoes, also moving southeastward, occurred at Thomas, W. Va., and in Maryland at Frostburg, near Olney, and at Laurel. It is doubtful that the severe tornado which struck Cambridge over in Dorchester County, Md., at 11:15 p. m. E. S. T., and moved about 28 miles southeastward to Delmar could have been the same one that began at Ravenna, Ohio.

The American Red Cross reported 153 persons killed, 846 seriously injured, 1,686 families affected, 404 homes destroyed, 821 other buildings destroyed, 691 homes damaged and 765 other buildings damaged. Of the deaths, 103 occurred in West Virginia, 45 in southwestern Pennsylvania and 5 in Maryland. The total property damage approximated \$5,160,000, of which \$2,000,000 occurred in West Virginia, \$2,000,000 in Pennsylvania, and \$1,160,000 in Maryland. The major loss of life occurred at Shinnston, Flemington, Meadowville, Montrose, and Thomas in West Virginia; Chartiers, McKeesport, and Smithfield, in Pennsylvania; and Oakland and Cambridge in Maryland. These were the only sizeable towns in their paths.

On June 22, the day preceding the above storms, another tornado in connection with the same low-pressure system, killed 7 people, injured 65 and destroyed property valued at \$1,025,000 in southern Wisconsin; then it crossed into northern Illinois where 2 more people were killed, 15 injured and \$400,000 worth of property destroyed.

During the evening of June 16 a group of small tornadoes injured two persons and caused \$1,000,000 property damage in Iowa. The slow movement of one of these funnels was especially interesting. At the first

farm where damage was done it appeared to remain nearly stationary for 10 to 20 minutes. Later it turned south-east for about 3 miles, then made a U-turn, first going south, then east, then north, and finally heading back toward the east. It was reported that it also remained whirling in the same position at two other farms for 10 and 5 minutes respectively.

At about 6:30 p. m., on April 8, a tornado, moving from west to east over a path $2\frac{1}{2}$ x 10 miles killed 1 per-

son, injured 7, and caused \$1,000,000 property damage near Pottsville, Hamilton County, Tex. Another quite severe tornado struck New Holland, a suburb of Gainesville, Ga., early on April 16, and moved eastward into South Carolina, where it caused considerable destruction in and around Greenwood. In Georgia, 23 lives were lost and \$1,000,000 worth of property, while in South Carolina 18 people were killed, 116 injured and property valued at \$300,000 was destroyed.

TABLE 1.—Tornadoes and probable tornadoes

State*	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama:													
Number			4	2									6
Deaths			5	2									7
Injuries			63	20									83
Damage (\$ X 1,000)			480.4	150.0									630.4
Arkansas:													
Number				5									5
Deaths				44									44
Injuries				331									331
Damage (\$ X 1,000)				700.0									700.0
California:													
Number											1		1
Deaths											0		0
Injuries											0		0
Damage (\$ X 1,000)											75.0		75.0
Florida:													
Number			2					2		3			7
Deaths			0					0		0			0
Injuries			0					0		0			0
Damage (\$ X 1,000)			10.0					(?)		(?)			* 10.0
Georgia:													
Number		2		4									6
Deaths		0		24									24
Injuries		0		(?)									(?)
Damage (\$ X 1,000)		50.0		1,560.0									1,610.0
Illinois:													
Number						1							1
Deaths						2							2
Injuries						15							15
Damage (\$ X 1,000)						400.0							400.0
Indiana:													
Number				3									3
Deaths				0									0
Injuries				0									0
Damage (\$ X 1,000)				7.0									7.0
Iowa:													
Number				1	16	9	1	2					29
Deaths				0	3	0	0	0					3
Injuries				0	30	0	1	0					31
Damage (\$ X 1,000)				20.0	1,000.0	* 1,075.0	(?)	29.0					* 2,124.0
Kansas:													
Number			1	11	1	6	5	1	1				26
Deaths			0	0	0	0	0	0	0				0
Injuries			1	3	0	0	0	0	0				4
Damage (\$ X 1,000)			1.0	311.6	2.0	50.8	50.0	15.0	73.2				503.6
Louisiana:													
Number		1			1								2
Deaths		1			2								3
Injuries		4			8								12
Damage (\$ X 1,000)		(?)			(?)								(?)
Maryland and Delaware:													
Number						5							5
Deaths						5							5
Injuries						60							60
Damage (\$ X 1,000)						1,160.0							1,160.0
Minnesota:													
Number						2	1	1					4
Deaths						0	0	0					0
Injuries						6	0	0					6
Damage (\$ X 1,000)						500.0	10.0	(?)					(?) 510.0
Missouri:													
Number				2									2
Deaths				0									0
Injuries				8									8
Damage (\$ X 1,000)				50.0									50.0
Montana:													
Number						1							1
Deaths						0							0
Injuries						0							0
Damage (\$ X 1,000)						(?)							(?)
Nebraska:													
Number		1			3								4
Deaths		0			0								0
Injuries		0			1								1
Damage (\$ X 1,000)		1.8			177.0								178.8
New Mexico:													
Number									1				1
Deaths									0				0
Injuries									0				0
Damage (\$ X 1,000)									25.0				25.0
North Carolina:													
Number				1					1				2
Deaths				0					0				0
Injuries				8					0				8
Damage (\$ X 1,000)				225.0					50.0				275.0
North Dakota:													
Number					5	3							8
Deaths					0	0							0
Injuries					0	0							0
Damage (\$ X 1,000)					6.0	(?)							* 6.0

See footnotes at end of table.

TABLE 1.—Tornadoes and probable tornadoes—Continued

State*	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Ohio:													
Number.....			1			2							3
Deaths.....			0			0							0
Injuries.....			0			0							0
Damage (\$×1,000).....			3.0			(?)							* 3.0
Oklahoma:													
Number.....	3	1	2	10	3						1		20
Deaths.....	2	0	0	1	0						0		3
Injuries.....	27	0	35	16	2						5		85
Damage (\$×1,000).....	155.0	150.0	150.0	568.2	32.5						35.0		1,090.7
Pennsylvania:													
Number.....						3			1				4
Deaths.....						45			0				45
Injuries.....						412			0				412
Damage (\$×1,000).....						2,000.0			50.0				2,050.0
South Carolina:													
Number.....			1	5									6
Deaths.....			0	19									19
Injuries.....			0	120									120
Damage (\$×1,000).....			10.0	314.0									324.0
South Dakota:													
Number.....							2						2
Deaths.....							0						0
Injuries.....							3						3
Damage (\$×1,000).....							200.0						200.0
Tennessee:													
Number.....				1		1							2
Deaths.....				1		0							1
Injuries.....				0		3							3
Damage (\$×1,000).....				40.0		(?)							* 40.0
Texas:													
Number.....				2	2	1							5
Deaths.....				1	3	0							4
Injuries.....				7	8	1							16
Damage (\$×1,000).....				1,001.1	107.0	(?)							* 1,108.1
Virginia:													
Number.....			2	1									3
Deaths.....			0	3									3
Injuries.....			36	0									36
Damage (\$×1,000).....			650.0	5.0									655.0
West Virginia:													
Number.....						3							3
Deaths.....						103							103
Injuries.....						430							430
Damage (\$×1,000).....						2,000.0							2,000.0
Wisconsin:													
Number.....						3	1						4
Deaths.....						7	0						7
Injuries.....						65	0						65
Damage (\$×1,000).....						1,065.0	20.0						1,085.0
Wyoming:													
Number.....					2	2		1					5
Deaths.....					0	0		0					0
Injuries.....					5	0		0					5
Damage (\$×1,000).....					5.0	2.0		(?)					7.0
United States:													
†Number.....	3	5	13	45	32	36	10	7	4	3	2	0	160
Deaths.....	2	1	5	95	8	162	0	0	0	0	0	0	273
Injuries.....	27	4	135	513	54	992	4	0	0	0	5	0	1,734
Damage (\$×1,000).....	155.0	* 201.8	1,304.4	4,951.9	1,329.5	** 8,252.8	* 280.0	* 44.0	198.2	(?)	110.0	0	* 16,827.6

* None reported for States not listed.

† Corrected for boundary crossing tornadoes.

‡ Many.

§ Slight.

* Several thousand.

* Considerable.

* Includes some straight wind, hail and water damage.

* Additional damage not included.

THE WEATHER OF 1944 IN THE UNITED STATES

By J. L. BALDWIN

[Weather Bureau, Washington, D. C.]

THE year 1944 was notable for its unusually destructive storms. Hurricanes, tornadoes, straight-line winds, hail and floods caused enormous losses. Farm work received a serious setback by a wet spring in large areas, but more favorable weather followed in most sections. Droughts prevailed in mid-Atlantic areas, most of the Ohio Valley and in the far West.

At the beginning of the year cold and wet weather was prevailing over most of the South, while most central and northern States were unusually warm for the season and extremely dry, until the closing days of January when abnormally heavy rain or snow occurred in the Great Plains and a large north-central area. Buds had begun to swell as far north as Minnesota. All-time January maximum temperature records were broken in many extreme north-central States, while it was abnormally cold in the Great Basin of the West. It was the driest January on record in Montana. A severe glaze storm on the 13th and 14th did \$18,000,000 damage, mostly to timberland, in eastern Texas and northwestern Louisiana.

Mild weather continued in most sections east of the Rockies until the second decade of February when an extensive cold wave brought sub-zero readings into the northern interior, with -43° at Golve, N. Dak., on the 11th and freezing southward to west-central Florida on the 13th. Heavy snow, which preceded this coldness, afforded ample protection to winter crops in most northern areas. This in turn was followed by a return to above normal warmth during the latter part of the month and new high February temperature records were established in extreme northern interior areas around the 26th. It rained or snowed on at least half of the days in Tennessee, a new record.

March was cold, cloudy, and abnormally wet over the greater portion of the country. Some States south of the Ohio Valley received 3 times their normal amount of precipitation. It was the wettest March of record in South Carolina and Georgia. Spring farm work became from 2 to 4 weeks behind normal quite generally east of the Rockies. A severe hailstorm, with stones up to 3 inches in diameter caused \$3,000,000 damage at Memphis, Tenn., and adjacent areas.

April was a month of disastrous floods in the Southeast, the Great Plains and middle Mississippi Valley. Excessive rains in areas where rivers were running near bankful produced crests near and in some cases exceeding record crests of 1943. The Mississippi crested at St. Louis Mo., on April 30 at 39.1 feet exceeded only by the flood of 1844 when 41.4 feet was reached. Rainfall at St. Louis, Mo., was the greatest April total since 1893 and Peoria, Ill., had the wettest April in its history. It was the wettest April in Utah on record. In Nebraska subsoil moisture was fully restored for the first time since the drought years of 1934 and 1936. Farm work was further delayed. Heavy hail did nearly \$3,000,000 damage to the fruit crop in California, and peaches in the South suffered from early freezes.

Floods continued in some areas in May, especially in Iowa. The Mississippi rose to the highest stage ever recorded from Keokuk, Iowa, to Hannibal, Mo. It was

the wettest May in the last half century in the North-Central States and unusually heavy rains fell in the western Cotton Belt. The month became exceptionally cold, with freezing almost to the Ohio Valley, on the 5th and 7th, followed by unusual warmth. It was the warmest May of record in Pennsylvania.

June was characterized by above normal temperatures in practically the entire region east of the Rockies, extreme dryness in most sections from the central Mississippi, Ohio, and Potomac Valleys to the Gulf and Rio Grande Valley, and unusually heavy precipitation from the western Lake region westward. It was the wettest month that ever occurred in Montana and the wettest June on record in Wyoming, while the Norfolk area of Virginia was suffering from its most severe drought in history. Tornadoes, straight-line winds, thunderstorms, and hail killed over 200 people and destroyed over \$25,000,000 worth of crops and property during this month.

During July the drought continued in a large area, extending from the eastern Lake region, Pennsylvania and New Jersey to Texas, while unusually wet weather prevailed from Kansas to Minnesota. Tennessee reported the driest and warmest May to July period in its climatic history.

By August the drought had become one of the worst in years in much of the Ohio Valley. In southern Illinois rainfall for the previous 2 months was only 25 percent of normal, which represented an actual water deficiency of about 70,000 tons for every 100-acre farm in that area. Heavy rains fell in the south Atlantic and Gulf coastal plains and quite generally from southern Texas to Minnesota and the Dakotas. This caused considerable delay in harvesting and threshing grain in the Northern Plains and some deterioration resulted, especially in the Red River of the North Valley. It was the wettest summer on record in Minnesota. On the 26th, hailstones covered parts of Denver, Colo., to a depth of 5 to 6 inches and caused damage estimated at \$1,000,000. Hailstorm damage in Montana alone for this month approximated the unusual loss of \$10,500,000.

September will be remembered as the month of the great Atlantic hurricane, the severity of which was comparable with that of 1938. This storm affected 900 miles of the East coast from Hatteras northward. Maximum wind velocities equaled or exceeded all previous records at Hatteras, Cape Henry, Atlantic City, New York, and Block Island. The highest velocity recorded by instrument was 134 miles per hour at Cape Henry, Va. A total of 390 lives were lost including marine fatalities, and property losses approximated \$100,000,000. Precipitation was unusually heavy from the Texas coast to northern Florida and from Tennessee and North Carolina to Maine. Many September high temperature records were broken in the Pacific Northwest.

Another important hurricane visited our East coast in October, striking the Southwest coast of Florida and moving northward through the Carolinas and Virginia with rapidly diminishing intensity. Most of the damage was therefore confined to the Southeast, particularly Florida, where heavy loss of fruit occurred. In this State 18 lives were lost and the crop and property damage was

estimated to be \$63,000,000, on the 18th and 19th. Wind velocities in excess of 100 miles per hour were recorded during this storm.

November was generally a quiet month. Near the end of the month the first general subzero temperatures of the season occurred in the north-central area where minima as low as 15° below zero were reported.

Temperatures dropped to 30° below zero over extreme northern sections during December and the first really widespread snows and blizzards of the winter occurred. Cold weather penetrated the deep South causing considerable damage, and truck losses in Florida were heavy. On the 27th and 28th an extensive area of moderate glaze covered much of the region from northern Texas and the Mississippi Valley eastward.

Some sections of Pennsylvania, northern Ohio, West Virginia, and adjoining areas reported the greatest total December snowfall on record and in a few cases a near-record for an extended period of snow cover, while accumulations in the far West were considerably below normal.

TEMPERATURES

The mean temperature for the year 1944, derived by weighting the averages for the varying areas of the several States, was 53.2° or the same as the average for the 1886 to 1944 period, during which time the highest mean annual temperature was 55.6° in 1921 and the lowest 51.8° in 1917.

Monthly and annual State temperature departures are presented in table 1, supplemented by a chart showing the annual distribution areally.

Yearly temperatures averaged generally from 1° to over 2° above normal in the far northwestern border districts, elsewhere from the western portion of the Great Plains to the Pacific coast they were mostly below normal, especially between Wyoming and southern California. It was generally warmer than normal for the year in the remaining portion of the country. Departures averaged 2° above normal in a large northern interior area.

The highest State yearly average was 70.8° for Florida and the lowest 39.5° for North Dakota. The greatest monthly average was 83.8° for Texas during July while the lowest was the February average of 11.2° for North Dakota. The latter value was considerably higher than in 1943 when the lowest State average for the country was -1.4° , which also occurred in North Dakota, during January.

PRECIPITATION

The average annual precipitation for the country as a whole, based on weighted averages, was 30.38 inches, or 1.31 inches more than the average for the 1886 to 1944 period, during which time the wettest year was 32.74 inches in 1915 and the driest 24.65 inches in 1910.

Figure 1 gives the percentages of normal precipitation by States for 1944; figure 2, the percentages for the growing season; table 2, the percentages for the months and the year; and table 3, the monthly and annual amounts. The areal distribution of annual precipitation is shown in percentages by chart.

Precipitation for the year was much below normal from the Ohio Valley to southern Michigan, in the Pacific Northwest, some far southwestern areas and southern Florida.



FIGURE 1.—Percentage of normal precipitation, 1944.



FIGURE 2.—Percentage of normal precipitation, April 1–September 30, 1944.

It was considerably above normal in a large area extending from Montana, North Dakota, and Minnesota southward to Texas, thence eastward to Georgia and northern Florida.

On a State basis, annual precipitation exceeded its normals by about 5 to 15 percent in the Cotton Belt and by about 15 to over 40 percent in the Western Plains and adjacent areas. The deficiencies were greatest in Washington, Oregon, and from the lower Ohio Valley to Lake Erie.

On an annual basis, the wettest State was Louisiana with 61.79 inches. Other States averaging over 50 inches of precipitation for 1944 were Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina, and Tennessee. During 1943 Louisiana with 51.73 inches, was the only State to exceed 50 inches. The driest State, as is usually the case, was Nevada with 8.61 inches.

During the April to September growing season average State values show that more than the usual amount of precipitation was received in the greater portion of the country extending from Oregon and Utah to the western Lakes and thence southward to Texas and the Gulf, with totals exceeding the normals by 20 to over 40 percent in the western Plains and northern interior. Seasonal precipitation averaged 15 percent below normal for Arizona, Nevada, South Carolina, and New Jersey.

TABLE 1.—Monthly and annual temperature departures from normal for the year 1944

State	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama.....	+0.6	+0.8	+1.7	-0.6	+1.7	+2.8	-0.2	-0.2	+0.8	-0.6	+0.6	-1.2	+1.0
Arizona.....	-1.4	-2.9	-3.6	-3.6	-1.3	-4.1	-1.0	+0.6	+0.6	+2.4	-2.9	+0.9	-1.4
Arkansas.....	+1.0	+4.5	-1.1	-1.4	+1.1	+2.0	+0.6	-0.1	-0.5	+1.1	+1.4	-4.8	+0.3
California.....	+0.7	-2.0	-0.2	-3.0	-0.1	-4.3	-2.7	-0.6	+1.7	+1.5	-3.2	+1.0	-0.9
Colorado.....	-0.8	-0.2	-3.2	-4.2	+0.9	-0.9	-0.7	+1.0	+0.8	+2.7	+0.1	+0.3	-0.4
Florida.....	-1.6	+5.2	+2.7	+1.7	-0.1	+2.1	-0.3	+0.1	+1.7	-1.8	-0.8	-3.0	+0.5
Georgia.....	-0.6	+5.9	+0.6	-1.0	+1.2	+2.5	-1.2	-1.1	+0.4	-1.0	-1.0	-3.4	+0.1
Idaho.....	-2.4	+0.3	-3.6	-1.1	-1.0	-2.7	-1.8	-1.9	+1.5	+4.7	-1.9	-1.6	-0.8
Illinois.....	+5.5	+3.7	-3.5	-1.9	+4.8	+3.7	-0.3	+0.9	+0.2	+0.3	+2.9	-6.0	+0.9
Indiana.....	+4.5	+4.0	-2.5	-1.0	+5.6	+3.9	+0.5	+1.6	-0.2	0.0	+1.8	-5.6	+1.0
Iowa.....	+11.4	+4.2	-4.2	-3.8	+4.4	+2.0	-2.0	-0.4	+0.4	+2.0	+4.0	-3.6	+1.2
Kansas.....	+4.5	+3.1	-4.1	-5.4	+2.5	+1.5	-1.8	0.0	-0.5	+1.6	+2.5	-2.3	+0.1
Kentucky.....	+1.9	+5.2	-1.0	-0.5	+4.5	+3.6	+0.4	+0.4	-1.6	-0.9	+0.1	-4.7	+0.6
Louisiana.....	-1.3	+6.1	+0.3	-0.3	-0.2	+1.9	+1.3	+0.8	+0.6	-1.6	+0.7	-2.9	+0.4
Maryland and Delaware.....	+1.7	+3.2	-2.3	-1.1	+5.4	+1.8	+0.7	+0.7	+0.6	-1.3	-0.1	-2.4	+0.6
Michigan.....	+6.8	+3.4	-2.9	-3.2	+4.5	+1.8	-0.4	+2.4	+0.4	-0.6	+3.0	-3.5	+1.0
Minnesota.....	+13.5	+2.8	-4.0	-3.1	+2.8	+0.7	-1.9	0.0	-0.7	+2.0	+5.1	+0.7	+1.5
Mississippi.....	-0.3	+6.0	+0.7	-0.7	+0.9	+2.5	+0.5	+0.4	+0.7	-0.6	+0.6	-2.2	+0.7
Missouri.....	+4.9	+4.7	-2.4	-3.1	+3.8	+2.7	-0.5	-0.7	-0.2	+1.9	+2.6	-5.1	+0.7
Montana.....	+5.9	+1.4	-4.6	+1.0	+2.3	-2.2	-2.3	-2.3	+1.5	+4.7	-1.4	-1.7	+0.2
Nebraska.....	+5.8	+0.8	-5.9	-5.3	+3.7	-0.2	-2.0	+0.5	-0.6	+2.2	+0.8	-1.6	-0.2
Nevada.....	-2.4	-1.6	-2.6	-2.4	-1.0	-4.3	-1.4	-0.7	+3.3	+3.9	-3.8	-0.6	-1.0
New England.....	+1.3	-0.4	-2.7	-3.2	+4.5	-0.1	+1.1	+3.4	+1.1	-0.9	+0.5	-2.6	+0.2
New Jersey.....	+1.6	+1.7	-2.1	-1.7	+4.9	+1.4	+1.8	+1.9	+1.0	-1.0	+0.2	-3.1	+0.6
New Mexico.....	-3.3	-0.5	-2.3	-2.7	-0.5	-0.9	-0.4	-0.9	-0.4	+1.3	-1.0	-0.2	-0.8
New York.....	+3.0	0.0	-3.2	-3.3	+6.1	+1.2	+1.4	+3.1	+1.1	-1.1	+0.9	-3.8	+0.4
North Carolina.....	-0.3	+2.9	-0.9	+0.1	+3.5	+2.6	-1.4	-1.2	+0.7	-0.4	-1.6	-4.5	0.0
North Dakota.....	+15.1	+1.4	-6.9	-0.7	+4.6	-1.2	-1.4	-0.9	+0.4	+4.5	+0.2	+2.3	+1.4
Ohio.....	+3.9	+3.8	-2.0	-1.6	+6.0	+3.4	+0.6	+1.9	-0.6	-0.3	+1.1	-5.6	+0.9
Oklahoma.....	+1.2	+3.8	-2.1	-2.1	+1.0	+2.0	-0.3	+1.0	-0.9	+1.4	+2.5	-2.5	+0.4
Oregon.....	-1.3	-0.5	-1.8	-1.7	-0.1	-2.5	-1.6	-0.8	+2.1	+3.8	-2.8	-1.3	-0.7
Pennsylvania.....	+2.2	+1.0	-3.1	-3.1	+5.8	+1.1	0.0	+1.2	-0.6	-1.7	+0.3	-5.0	-0.2
South Carolina.....	-0.3	+4.1	-0.7	-0.3	+1.8	+2.7	-2.0	-1.5	+1.0	-0.4	-1.4	-4.7	-0.1
South Dakota.....	+9.8	-1.0	-7.3	-3.5	+4.5	-1.6	-2.8	-0.9	-1.0	+2.6	-0.1	+0.2	-0.1
Tennessee.....	+1.1	+5.2	+0.1	-1.3	+3.5	+3.3	+0.2	+0.7	+0.2	-0.8	0.0	-4.3	+0.7
Texas.....	-1.2	+3.1	-1.4	-0.6	-0.1	+1.0	+0.8	+0.8	-1.3	-0.3	+0.6	-2.7	-0.1
Utah.....	-5.3	-3.0	-4.4	-3.5	+0.3	-4.4	-0.6	+0.3	+1.5	+3.8	-1.2	+1.7	-1.2
Virginia.....	+1.2	+2.5	-1.9	-0.5	+5.2	+2.2	-0.1	-0.3	0.0	-0.7	-0.8	-4.3	+0.2
Washington.....	+1.4	+1.2	-1.8	+0.2	+0.5	0.0	+0.7	-0.8	+3.1	+4.3	+0.2	-2.1	+0.6
West Virginia.....	+0.6	+3.9	-2.1	-1.0	+5.3	+2.0	-0.6	+0.4	-1.3	-1.0	-0.7	-5.2	0.0
Wisconsin.....	+10.4	+4.3	-2.9	-3.0	+4.4	+2.3	-1.0	+2.3	+0.6	+0.6	+5.6	-2.6	+1.8
Wyoming.....	-1.0	-0.6	-3.8	-0.6	+2.6	-2.2	-1.7	+0.1	+0.6	+3.9	-0.9	-1.9	-0.5

TABLE 2.—Percentage of normal precipitation, 1944

State	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama.....	73	135	184	209	74	65	76	137	147	21	116	77	113
Arizona.....	63	193	115	151	175	18	56	66	120	76	188	91	102
Arkansas.....	57	210	131	138	133	75	70	138	55	120	120	191	115
California.....	65	139	51	119	76	161	114	22	17	99	238	70	100
Colorado.....	143	73	138	105	118	65	103	43	31	87	145	89	101
Florida.....	90	52	177	142	74	78	126	110	90	141	70	28	101
Georgia.....	92	135	216	188	62	60	82	94	119	86	94	50	108
Idaho.....	42	84	57	159	49	237	59	50	95	45	115	65	90
Illinois.....	24	124	135	189	104	62	57	113	82	45	70	78	93
Indiana.....	19	117	116	174	110	47	51	118	73	42	80	70	86
Iowa.....	98	103	150	165	152	136	106	164	60	50	105	115	121
Kansas.....	158	122	206	287	102	75	151	180	70	92	152	256	142
Kentucky.....	36	130	117	118	92	41	47	145	133	51	71	96	89
Louisiana.....	154	104	124	107	164	44	52	137	105	36	204	117	112
Maryland and Delaware.....	99	82	152	116	61	79	56	82	143	112	135	108	100
Michigan.....	58	86	134	80	93	135	99	86	118	44	101	76	95
Minnesota.....	75	101	103	94	166	163	125	162	103	20	148	29	120
Mississippi.....	82	152	167	142	125	42	77	130	103	30	143	132	114
Missouri.....	26	148	118	171	94	55	74	160	71	60	87	105	98
Montana.....	34	83	99	81	96	209	66	154	90	23	90	67	104
Nebraska.....	263	128	144	200	118	121	129	118	42	58	199	60	124
Nevada.....	83	139	66	142	52	218	18	0	44	55	291	45	97
New England.....	48	78	111	106	41	147	82	47	164	82	140	93	95
New Jersey.....	96	67	149	149	45	106	31	59	207	67	203	85	102
New Mexico.....	125	73	48	115	91	75	96	110	105	125	145	116	101
New York.....	56	84	111	129	83	121	69	60	134	74	108	111	95
North Carolina.....	95	157	172	124	76	80	109	71	180	94	128	72	108
North Dakota.....	76	59	108	56	124	186	70	224	100	12	388	12	128
Ohio.....	31	97	140	132	104	80	44	118	65	57	75	107	88
Oklahoma.....	117	209	138	121	91	99	109	115	89	95	136	153	114
Oregon.....	52	82	57	121	66	170	105	35	93	55	92	43	74
Pennsylvania.....	65	68	134	117	111	109	56	61	111	99	97	122	95
South Carolina.....	102	143	231	147	58	63	102	58	91	125	94	41	102
South Dakota.....	229	114	77	95	121	159	141	169	62	59	319	43	129
Tennessee.....	53	215	128	121	77	51	48	114	235	52	91	134	109
Texas.....	195	147	128	69	178	58	64	173	91	55	154	152	119
Utah.....	136	91	155	248	103	388	31	18	31	46	186	79	113
Virginia.....	81	156	151	91	77	56	75	79	243	108	105	88	106
Washington.....	67	77	62	115	86	84	29	51	136	52	97	37	73
West Virginia.....	57	116	135	125	106	95	58	72	136	143	80	145	103
Wisconsin.....	67	101	112	96	103	153	71	104	85	24	131	58	95
Wyoming.....	104	99	137	135	102	217	106	21	74	54	160	95	112

Annual Temperature Departures (°F.) in the United States, 1944



Unshaded portions show deficiency (—)
Lines show amount of excess or deficiency

Percentage of Normal Annual Precipitation in the United States, 1944

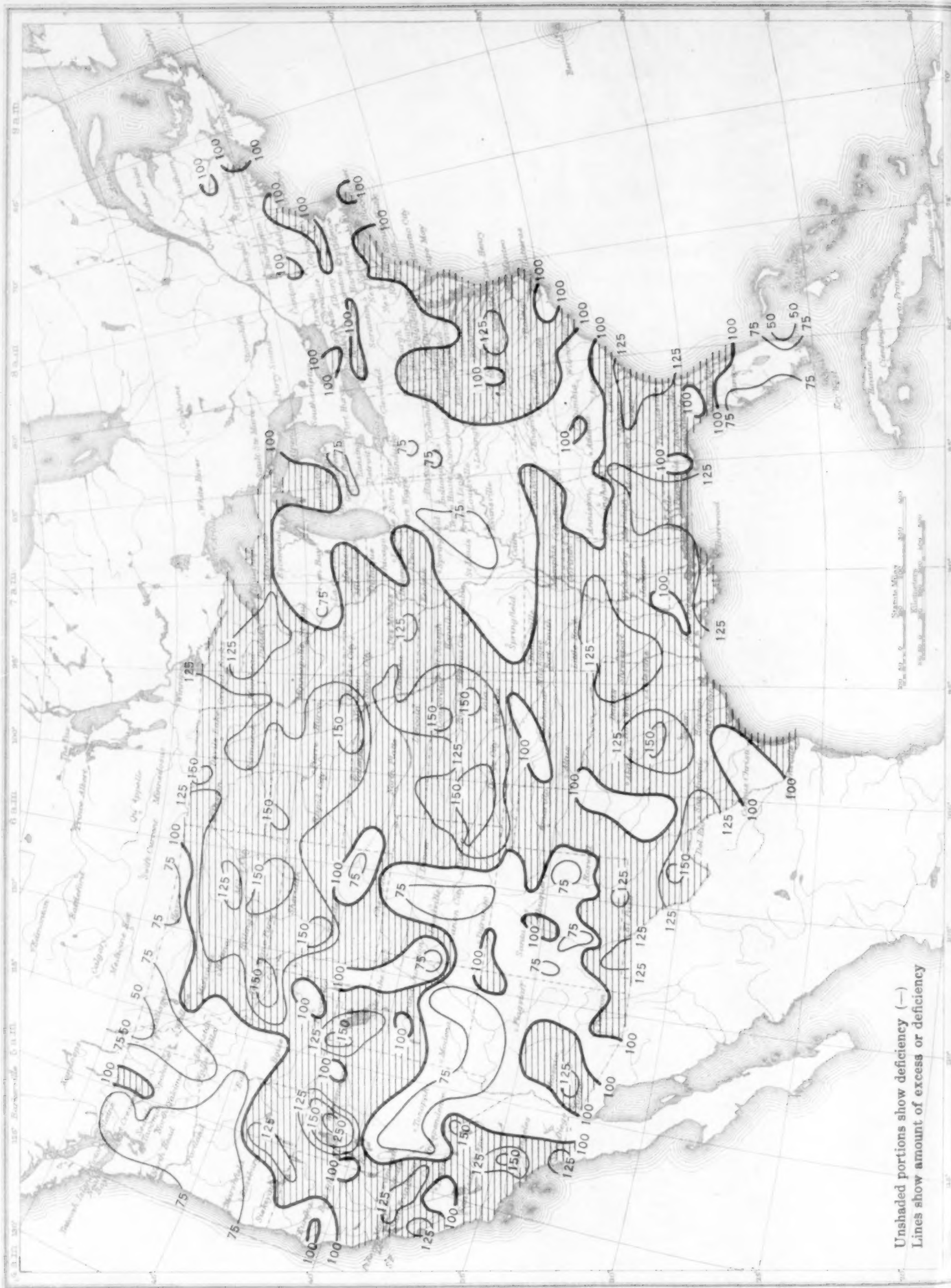


TABLE 3.—Monthly and annual precipitation (inches), 1944

State	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama.....	3.62	7.21	10.77	9.29	2.89	2.80	4.21	6.42	4.79	0.56	3.70	3.76	60.02
Arizona.....	0.79	2.58	1.18	0.86	0.56	0.06	1.18	1.50	1.54	0.62	1.77	1.17	13.81
Arkansas.....	2.50	7.34	6.13	6.65	6.42	3.04	2.61	4.90	1.84	1.13	4.70	7.86	55.12
California.....	3.14	6.04	1.85	2.02	0.76	0.50	0.08	0.02	0.08	1.21	5.49	2.82	24.01
Colorado.....	1.13	0.71	1.78	3.47	2.17	0.91	2.25	0.83	0.42	0.98	1.13	0.70	16.57
Florida.....	2.50	1.63	5.58	4.06	2.96	5.25	0.26	7.72	6.04	5.84	1.55	0.78	53.17
Georgia.....	3.97	6.61	10.59	6.86	2.15	2.68	4.83	4.95	4.40	2.34	2.48	2.08	53.94
Idaho.....	0.93	1.47	1.03	2.29	1.21	3.18	0.38	0.30	0.97	0.71	2.24	1.38	16.09
Illinois.....	0.57	2.44	4.27	6.51	4.19	2.42	1.82	3.78	2.98	1.22	1.86	1.66	33.72
Indiana.....	0.62	2.85	4.31	6.20	4.39	1.80	1.68	4.00	2.44	1.13	2.45	1.95	33.82
Iowa.....	1.06	1.10	2.58	4.55	6.13	5.88	3.73	5.88	2.25	1.08	1.73	1.29	37.26
Kansas.....	1.09	1.22	2.96	7.25	3.90	2.93	4.73	5.63	1.92	1.73	1.96	2.15	37.47
Kentucky.....	1.60	4.59	5.50	4.73	3.62	1.70	1.93	5.45	3.88	1.31	2.45	3.62	40.38
Louisiana.....	7.50	4.66	5.75	4.99	7.33	2.16	3.17	7.08	4.02	1.16	7.88	6.09	61.79
Maryland and Delaware.....	3.35	2.60	5.63	4.14	2.29	3.04	2.47	3.59	4.91	3.36	3.57	3.34	42.29
Michigan.....	1.17	1.52	2.76	2.13	2.98	4.16	2.68	2.39	3.74	1.17	2.53	1.58	28.81
Minnesota.....	0.60	0.77	1.10	2.01	5.22	6.60	4.13	5.14	2.02	0.36	1.69	0.23	29.86
Mississippi.....	4.25	7.46	9.44	6.99	5.37	1.81	3.84	5.42	3.13	0.78	5.18	6.97	60.04
Missouri.....	0.63	3.10	3.78	6.68	4.44	2.55	2.62	6.09	2.82	1.68	2.34	2.26	38.99
Montana.....	0.30	0.59	0.93	0.92	1.98	5.35	0.94	1.63	1.18	0.23	0.82	0.58	15.45
Nebraska.....	1.37	0.91	1.58	4.76	3.88	4.26	3.81	3.26	0.85	0.80	1.51	0.39	27.38
Nevada.....	1.01	1.46	0.64	1.09	0.44	1.07	0.07	T	0.19	0.33	1.86	0.45	8.61
New England.....	1.72	2.50	4.06	3.59	1.38	5.05	3.08	1.79	6.23	2.85	4.86	3.12	40.23
New Jersey.....	3.50	2.38	5.68	5.45	1.67	4.08	1.44	2.79	7.93	2.41	6.44	3.02	46.79
New Mexico.....	0.74	0.53	0.36	0.99	1.05	0.94	2.37	2.62	1.82	1.39	0.96	0.81	14.58
New York.....	1.68	2.32	3.41	3.90	2.83	4.44	2.71	2.27	4.70	2.41	3.35	3.26	37.28
North Carolina.....	3.60	6.35	7.20	4.47	2.76	2.37	6.44	3.99	7.05	3.06	3.42	2.72	53.43
North Dakota.....	0.37	0.29	0.81	0.80	2.73	6.43	1.74	4.40	1.46	0.12	2.25	0.06	21.46
Ohio.....	0.96	2.45	4.87	4.25	3.76	3.08	1.69	4.02	1.92	1.42	2.05	2.89	33.36
Oklahoma.....	1.42	2.86	2.91	4.02	4.11	3.67	3.05	3.46	2.74	2.73	2.75	2.46	36.18
Oregon.....	2.12	2.58	1.63	2.45	1.13	2.18	0.45	0.14	1.12	1.09	3.32	1.72	19.93
Pennsylvania.....	2.12	1.99	4.69	4.04	4.28	4.51	2.39	2.55	3.83	3.15	2.51	3.79	40.15
South Carolina.....	3.67	6.06	8.85	4.74	2.07	3.03	5.90	3.32	3.66	3.68	2.20	1.44	48.62
South Dakota.....	1.26	0.65	0.84	1.96	3.39	5.27	3.49	3.71	0.92	0.66	1.98	0.24	24.37
Tennessee.....	2.56	9.39	6.95	5.37	3.21	2.14	2.14	4.66	7.08	1.43	3.23	6.07	54.23
Texas.....	3.68	2.67	2.60	2.02	6.51	1.81	1.68	4.16	2.71	1.39	3.49	3.46	36.18
Utah.....	1.65	1.15	2.16	2.88	1.17	2.21	0.27	0.18	0.31	0.49	1.67	0.88	15.02
Virginia.....	2.65	4.90	5.59	3.08	3.01	2.35	3.48	3.56	7.84	3.29	2.64	2.67	45.06
Washington.....	3.29	2.83	2.09	2.77	1.70	1.47	0.22	0.40	2.32	1.56	4.84	2.09	25.58
West Virginia.....	2.11	3.77	5.21	4.43	4.35	4.19	2.65	2.96	4.19	4.07	2.22	4.63	44.78
Wisconsin.....	0.95	1.31	2.02	2.41	3.65	6.04	2.43	3.44	3.08	0.59	2.39	0.80	29.11
Wyoming.....	0.84	0.77	1.55	2.10	2.06	3.41	1.43	0.23	0.82	0.58	1.09	0.69	15.57

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JANUARY 1945

[Climate and Crop Weather Division, W. A. Mattice, acting in charge]

AEROLOGICAL OBSERVATIONS

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during January 1945

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m. s. l.	Albany, N. Y. (86 m.)				Albuquerque, N. Mex. (1,620 m.)				Apalachicola, Fla. (5 m.)				Atlanta, Ga. (300 m.)				Big Spring, Tex. (774 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (868 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface.....	31	1,006	-11.0	72	31	838	3.6	51	31	1,020	10.8	70	31	984	5.0	70	31	930	7.1	65	31	958	-9.6	86	31	922	0.1	87
500.....	31	953	-11.4	77	31	800	2.4	50	31	961	10.6	59	31	960	5.3	62	31	904	8.2	55	31	899	-8.0	82	31	907	-0.2	84
1,000.....	31	893	-12.5	78	31	752	-0.3	49	31	905	9.5	45	31	903	3.5	61	31	851	6.5	48	31	843	-7.6	72	31	852	-1.2	81
1,500.....	31	836	-12.5	73	31	706	-3.4	53	31	853	8.0	42	31	850	2.7	49	31	801	4.4	42	31	790	-7.9	64	31	800	-2.0	72
2,000.....	31	783	-13.3	69	31	621	-9.1	43	31	802	6.5	36	31	798	1.7	40	31	752	1.7	41	31	741	-9.9	59	31	751	-3.8	63
2,500.....	31	733	-14.2	63	31	545	-15.4	42	31	754	4.7	33	31	750	0.1	40	31	707	-0.6	34	31	694	-12.2	60	31	704	-6.5	63
3,000.....	31	686	-15.8	60	31	477	-22.0	30	31	709	2.3	34	31	705	-2.0	40	31	623	-6.3	30	31	608	-17.0	54	31	619	-11.8	55
4,000.....	30	600	-20.4	53	31	415	-29.0	28	31	626	-3.1	29	31	621	-7.2	29	31	548	-12.7	27	31	532	-22.8	31	543	-18.0	59	
5,000.....	30	523	-26.4	44	31	360	-36.7	25	31	550	-9.6	27	31	545	-13.5	27	31	479	-19.9	30	31	464	-29.2	31	474	-24.6	54	
6,000.....	29	455	-32.9	39	31	310	-44.5	22	31	483	-16.4	27	31	478	-19.9	27	31	418	-27.6	29	31	402	-35.7	31	412	-31.8	54	
7,000.....	29	393	-39.0	30	31	267	-51.5	19	31	422	-23.4	26	31	416	-27.3	26	31	363	-34.9	28	31	347	-43.2	30	357	-39.1	54	
8,000.....	29	339	-45.1	24	31	214	-52.6	17	31	367	-30.4	23	31	362	-34.7	23	31	313	-41.7	29	31	299	-49.9	24	308	-46.2	54	
9,000.....	29	291	-50.5	18	31	167	-58.4	12	31	318	-37.8	20	31	313	-41.7	20	31	270	-49.6	27	31	256	-56.5	20	265	-53.5	54	
10,000.....	29	250	-53.0	14	31	114	-61.3	8	31	274	-45.7	18	31	270	-49.2	18	31	231	-55.2	24	31	219	-59.5	16	227	-59.2	54	
11,000.....	23	214	-52.6	10	31	88	-61.3	5	31	235	-52.8	12	31	232	-55.5	12	31	198	-58.7	19	31	186	-58.9	10	193	-62.5	54	
12,000.....	21	183	-52.0	7	31	58	-61.3	3	31	201	-56.3	11	31	197	-58.2	11	31	168	-58.5	14	31	159	-57.8	5	165	-61.9	54	
13,000.....	17	156	-52.1	5	31	31	-61.3	1	31	171	-58.7	6	31	168	-58.7	6	31	143	-59.5	7	31	122	-61.3	5	123	-61.7	54	
14,000.....	11	133	-52.7	3	31	14	-61.3	1	31	146	-61.6	11	31	143	-59.5	11	31	103	-64.2	5	31	98	-55.5	5	98	-55.5	54	
15,000.....	8	114	-53.8	1	31	8	-61.3	1	31	8	-61.3	8	31	8	-61.3	8	31	8	-61.3	8	31	8	-61.3	8	8	-61.3	8	8
16,000.....	5	98	-55.5	1	31	5	-61.3	1	31	5	-61.3	5	31	5	-61.3	5	31	5	-61.3	5	31	5	-61.3	5	5	-61.3	5	5

Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine (193 m.)				Charleston, S. C. (14 m.)				Denver, Colo. (1,616 m.)				Dodge City, Kans. (787 m.)				El Paso, Tex. (1,195 m.)				
Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	
Surface.....	30	1,018	16.0	90	29	991	-8.8	88	31	986	-12.8	92	31	1,017	6.9	85	31	837	-1.7	67	31	927	-1.4	77	31	883	7.7	45
500.....	30	961	15.2	79	29	955	-10.4	88	31	947	-13.4	91	31	950	8.0	66	31	798	-0.5	55	31	903	1.1	66	31	852	9.2	41
1,000.....	30	906	13.0	72	29	895	-11.7	87	31	888	-13.6	88	31	903	5.9	59	31	749	-2.0	52	31	849	1.1	58	31	800	6.2	41
1,500.....	30	854	11.2	67	29	839	-12.9	82	31	831	-13.6	82	31	849	3.5	59	31	708	-0.5	54	31	797	-0.5	54	31	753	3.3	42
2,000.....	30	804	9.6	60	29	785	-14.0	75	31	778	-14.5	76	31	798	2.2	42	31	618	-11.6	54	31	703	-5.1	48	31	708	0.0	39
2,500.....	30	757	7.5	50	29	735	-15.1	66	31	728	-15.9	72	31	750	0.9	35	31	542	-18.3	47	31	618	-10.9	51	31	624	-6.2	34
3,000.....	30	712	5.0	43	29	688	-16.3	61	31	681	-17.6	67	31	705	-1.6	34	31	473	-25.2	47	31	542	-16.8	53	31	548	-12.6	54
4,000.....	30	629	-1.6	49	29	601	-20.9	57	31	595	-22.2	57	31	621	-6.4	31	31	412	-32.5	30	31	474	-23.4	53	31	480	-19.6	54
5,000.....	30	554	-8.1	46	29	525	-26.4	49	31	518	-28.2	49	31	546	-12.3	29	31	356	-39.9	29	31	412	-30.5	31	419	-26.7	54	
6,000.....	28	487	-14.3	51	29	456	-32.8	48	31	450	-34.4	48	31	478	-18.9	29	31	308	-47.4	27	31	357	-37.7	31	364	-34.2	54	
7,000.....	28	426	-21.5	47	27	395	-40.0	45	31	389	-41.0	45	31	418	-26.0	26	31	270	-49.2	27	31	308	-45.4	31	314	-41.9	54	
8,000.....	27	371	-28.7	43	27	340	-46.3	42	31	334	-47.4	42	31	363	-32.5	23	31	225	-57.5	20	31	226	-57.4	31	232	-55.3	54	
9,000.....	27	322	-36.1	38	23	292	-51.2	38	31	287	-52.5	38	31	314	-40.0	16	31	191	-57.7	14	31	165	-58.8	30	168	-57.6	54	
10,000.....	27	278	-43.4	33	20	251	-55.1	33	31	246	-54.7	33	31	271	-46.8	12	31	143	-59.5	7	31	122	-61.3	21	123	-61.7	54	
11,000.....	25	239	-50.5	28	16	215	-55.5	28	31	210	-53.9	28	31	233	-51.9	7	31	103	-64.2	5	31	98	-55.5	5	98	-55.5	54	
12,000.....	25	205	-56.5	23	13	183	-52.7	23	31	180	-52.4	23	31	198	-56.5	14	31	88	-61.3	8	31	88	-61.3	8	88	-61.3	8	
13,000.....	21	174	-60.5	18	11	156	-52.4	18	31	154	-52.6	18	31	169	-56.2	7	31	77	-61.3	7	31	77	-61.3	7	77	-61.3	7	
14,000.....	18	148	-62.7	10	10	134	-53.7	10	31	132	-53.3	10	31	143	-59.5	11	31	103	-64.2	5	31	103	-64.2	5	103	-64.2	5	
15,000.....	10	126	-65.6	8	8	114	-54.4	8	31	113	-54.8	8	31	122	-61.3	8	31	98	-55.5	5	31	98	-55.5	5	98	-55.5	5	
16,000.....	5	98	-55.5	5	5	98	-55.5	5	31	5	-61.3	5	31	5	-61.3	5	31	5	-61.3	5	31	5	-61.3	5	5	-61.3	5	

Ely, Nev. (1,908 m.)				Glasgow, Mont. (648 m.)				Grand Junction, Colo. (1,416 m.)				Great Falls, Mont. (1,128 m.)				Greensboro, N. C. (273 m.)				Hatteras, N. C. (3 m.)				Havana, Cuba ¹ (51 m.)				
Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	
Surface.....	31	810	-5.0	81	31	941	-8.9	86	31	861	0.5	67	31	887	-2.2	66	31	986	1.4	76	27	1,018	5.4	79	27	958	4.8	67
500.....	31	801	-3.0	73	31	844	-4.7	66	31	853	1.2	64	31	847	-1.6	58	31	958	1.8	66	27	958	4.8	67	27	901	2.7	60
1,000.....	31	753	-2.4	58	31	792	-5.9	63	31	801	-0.2	62	31	795	-3.3	58	31	846	-1.8	60	27	847	0.6	58	27	847	0.6	58
1,500.....	31	706	-5.2	57	31	742	-8.3	65	31	752	-2.7	61	31	746	-5.9	60	31	794	-3.4	54	27	795	-1.1	54	27	747	-2.9	49
2,000.....	31	6210																										

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during January 1945.—Continued

Altitude (meters) m. s. l.	Huntington, W. Va. (172 m.)				Int'l Falls, Minn. (343 m.)				Jackson, Miss. (97 m.)				Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				Little Rock, Ark. (79 m.)				Louisville, Ky. (165 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface.....	31	1,000	-2.4	82	31	978	-14.5	89	31	1,008	7.2	75	30	999	-7.3	88	31	1,020	10.4	80	31	1,011	4.4	78	30	1,001	-2.0	80
500.....	31	959	-3.0	78	31	957	-14.9	88	31	960	7.0	69	30	958	-7.7	87	31	962	10.0	65	31	960	3.8	71	30	959	-2.4	77
1,000.....	31	900	-4.6	73	31	896	-15.9	84	31	904	5.9	58	30	899	-8.5	85	31	906	8.9	52	31	903	2.7	65	30	901	-3.3	74
1,500.....	31	845	-6.0	74	31	839	-15.4	75	31	850	5.0	49	30	843	-7.3	68	31	853	7.6	46	31	849	1.5	60	30	846	-4.0	66
2,000.....	31	792	-6.9	73	31	785	-15.0	73	31	799	3.3	47	30	790	-8.0	65	31	802	5.7	41	31	797	-0.4	54	30	793	-5.3	64
2,500.....	31	743	-8.6	67	31	735	-16.2	69	31	752	1.1	43	30	741	-10.0	67	31	754	3.5	40	31	749	-2.3	52	30	744	-7.2	61
3,000.....	31	696	-10.7	65	31	687	-17.9	64	31	706	-0.7	39	30	694	-12.1	66	31	709	1.0	41	31	703	-4.2	46	30	698	-9.4	61
4,000.....	31	611	-15.6	60	31	600	-22.5	57	31	622	-6.2	38	30	608	-16.5	47	31	626	-4.4	36	31	619	-9.3	41	29	612	-14.3	61
5,000.....	31	534	-21.0	55	30	524	-28.0	51	31	547	-12.3	38	30	532	-22.3	37	31	550	-10.7	51	31	543	-15.5	44	29	536	-19.4	60
6,000.....	31	466	-26.9	49	29	455	-34.6	45	31	479	-18.4	35	29	464	-28.5	45	31	482	-17.5	45	31	475	-22.0	41	29	468	-25.7	59
7,000.....	31	404	-34.0	43	28	394	-40.5	41	31	418	-25.5	33	27	402	-35.7	41	31	421	-24.7	41	31	414	-29.5	37	27	407	-32.7	57
8,000.....	31	350	-41.0	38	28	339	-46.7	37	30	363	-33.0	30	26	348	-42.8	38	30	366	-32.2	38	30	358	-36.7	33	26	352	-40.0	56
9,000.....	31	301	-47.3	33	27	291	-51.7	32	30	314	-40.3	25	25	299	-49.9	39	30	317	-39.7	39	29	309	-43.7	27	21	304	-46.8	61
10,000.....	31	258	-52.2	28	25	249	-55.2	27	29	271	-47.4	22	23	256	-54.4	42	27	273	-47.4	42	29	266	-50.7	21	15	262	-51.9	62
11,000.....	30	222	-54.3	24	14	213	-55.5	23	29	233	-53.8	18	21	218	-55.7	49	29	235	-54.0	49	28	228	-55.7	12	12	224	-55.2	62
12,000.....	29	190	-55.0	20	7	182	-55.8	19	29	199	-57.5	17	17	187	-55.9	59	19	201	-57.4	59	25	195	-58.1	6	189	-51.6	62	
13,000.....	25	162	-55.5	15	5	156	-53.5	14	27	170	-58.6	8	8	158	-55.4	69	7	171	-60.1	69	22	165	-57.3	15	141	-59.7	62	
14,000.....	13	138	-56.4	10	23	140	-58.6	23	23	145	-60.6	23	135	-55.6	69	69	15	141	-59.7	69	15	141	-59.7	15	141	-59.7	62	
15,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
16,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
17,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
18,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
19,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
20,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
21,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
22,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
23,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
24,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
25,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
26,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
27,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
28,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
29,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
30,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
31,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
32,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
33,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
34,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
35,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
36,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
37,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
38,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
39,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
40,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
41,000.....	9	118	-57.9	9	16	123	-63.0	16	16	123	-63.0	16	135	-55.6	69	69	8	120	-61.6	69	8	120	-61.6	8	120	-61.6	62	
42,000.....	9	118	-57.9	9	16																							

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during January 1945.—Continued

Altitude (meters) m. s. l.	St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)				San Antonio, Tex. (240 m.)				San Juan, P. R. (15 m.)				Santa Maria, Calif. (71 m.)				S. Ste. Marie, Mich. (221 m.)				Spokane, Wash. (598 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface.....	31	1,000	-2.2	81	31	993	-10.1	84	31	992	10.2	77	31	1,015	22.9	82	31	1,011	9.7	78	31	991	-13.9	86	30	950	0.6	84
500.....	31	960	-3.4	81	31	958	-11.3	87	31	961	11.5	68	31	960	19.8	79	31	960	11.5	57	31	956	-13.2	82	30	904	-0.8	84
1,000.....	31	901	-3.3	71	31	898	-12.3	87	31	906	9.9	66	31	906	16.4	77	31	905	9.5	49	31	895	-14.4	78	30	849	-2.8	83
1,500.....	31	846	-3.6	65	31	841	-10.8	75	31	853	8.2	60	31	854	13.5	73	31	852	6.7	47	31	838	-15.9	75	30	796	-3.2	70
2,000.....	31	794	-5.0	64	41	788	-11.0	67	31	803	6.1	53	31	804	11.4	58	31	801	4.0	40	31	783	-16.7	65	30	748	-5.1	63
2,500.....	31	744	-6.9	56	31	738	-12.2	61	31	755	4.0	46	31	758	9.8	40	31	763	1.4	33	31	733	-17.5	57	30	701	-7.5	57
3,000.....	31	698	-9.0	52	31	691	-14.0	55	31	710	1.7	38	31	713	8.0	32	31	707	-1.4	33	31	685	-19.2	57	30	616	-13.0	55
4,000.....	31	613	-13.9	50	31	605	-18.7	53	31	626	-4.0	29	30	624	-7.2	35	31	598	-24.0	30	31	521	-29.7	29	30	540	-18.5	49
5,000.....	31	537	-19.4	48	31	529	-24.2	31	31	551	-10.4	23	30	548	-14.0	39	31	521	-29.7	29	31	452	-35.8	29	30	471	-25.2	29
6,000.....	31	468	-26.3	31	31	460	-30.2	30	30	483	-17.3	21	29	479	-20.9	29	31	452	-35.8	29	31	390	-42.5	29	30	410	-32.6	29
7,000.....	31	407	-33.5	31	31	399	-37.3	30	30	422	-24.6	20	431	-15.5	28	28	31	390	-42.5	29	31	336	-49.0	28	30	355	-39.7	28
8,000.....	29	351	-41.0	31	31	344	-44.3	28	28	367	-31.8	19	376	-22.9	28	28	31	336	-49.0	28	30	288	-53.9	28	30	306	-47.2	28
9,000.....	28	303	-47.9	30	30	296	-50.8	27	27	318	-39.1	17	327	-30.5	28	28	31	313	-43.5	28	29	288	-53.9	28	29	262	-54.1	26
10,000.....	24	260	-53.7	28	28	253	-56.1	27	27	274	-46.8	12	284	-37.9	28	28	26	269	-51.0	27	26	247	-55.7	26	24	225	-58.7	24
11,000.....	22	223	-57.4	27	27	217	-58.0	27	27	235	-54.1	11	246	-37.9	28	23	23	231	-55.9	23	22	212	-55.1	24	24	225	-58.7	24
12,000.....	18	190	-56.8	23	23	185	-57.8	23	23	201	-58.9	9	211	-37.9	28	19	19	197	-59.0	19	19	181	-53.9	19	19	191	-60.3	19
13,000.....	16	162	-56.2	21	21	157	-55.4	21	21	172	-59.5	6	180	-57.5	28	14	14	168	-60.9	13	13	154	-53.7	13	13	162	-57.1	13
14,000.....	13	138	-56.6	15	15	135	-55.8	16	16	146	-61.9	6	150	-57.5	28	7	7	144	-61.4	6	6	132	-52.9	6	7	138	-56.3	7
15,000.....	6	117	-57.4	6	6	114	-56.2	13	13	124	-64.6	7	105	-67.9	28	8	8	113	-53.5	5	5	113	-53.5	5	5	113	-53.5	5
16,000.....	7	105	-67.9	7	7	105	-67.9	7	7	105	-67.9	7	105	-67.9	28	8	8	113	-53.5	5	5	113	-53.5	5	5	113	-53.5	5

Altitude (meters) m. s. l.	Swan Island, W. I. ¹ (10 m.)				Tacubaya, Mexico (2,306 m.)				Tampa, Fla. (3 m.)				Tatoosh Island, Wash. (31 m.)				Toledo, Ohio (191 m.)				Washington, D. C. (25 m.)			
	Number of observations	Pressure	Temperature	Relative hu- midity	Number of observations	Pressure	Temperature	Relative hu- midity	Number of observations	Pressure	Temperature	Relative hu- midity	Number of observations	Pressure	Temperature	Relative hu- midity	Number of observations	Pressure	Temperature	Relative hu- midity	Number of observations	Pressure	Temperature	Relative hu- midity
Surface.....	31	775	13.8	48	31	775	13.8	48	27	1,020	13.8	78	31	1,014	7.4	81	31	996	-8.5	87	31	1,016	-1.1	69
500.....	27	962	13.3	63	27	962	13.3	63	27	962	13.3	63	31	958	5.6	73	31	957	-8.6	85	31	957	-3.5	65
1,000.....	26	907	11.2	61	26	907	11.2	61	26	907	11.2	61	31	901	2.7	72	31	898	-9.3	82	31	898	-4.7	69
1,500.....	26	854	9.5	54	26	854	9.5	54	26	854	9.5	54	31	847	0.4	71	31	843	-10.0	77	31	843	-6.1	69
2,000.....	26	804	8.2	45	26	804	8.2	45	26	804	8.2	45	31	796	-1.8	65	31	788	-10.4	71	31	790	-7.4	65
2,500.....	31	756	12.9	48	26	756	6.3	31	31	747	-3.9	56	31	747	-3.9	56	31	738	-11.8	70	31	741	-8.7	63
3,000.....	31	713	9.8	49	26	712	3.7	31	31	701	-5.9	49	31	701	-5.9	49	31	692	-13.8	70	31	694	-10.8	58
4,000.....	31	631	2.0	50	26	628	-1.4	30	30	616	-11.4	46	31	616	-11.4	46	31	605	-18.6	61	31	609	-16.1	56
5,000.....	31	557	-4.6	53	26	554	-7.7	30	30	540	-18.1	50	31	540	-18.1	50	31	529	-24.7	51	31	533	-21.6	51
6,000.....	28	490	-10.5	39	26	486	-14.0	30	30	472	-25.0	31	31	472	-25.0	31	31	460	-31.0	31	31	465	-28.2	31
7,000.....	28	430	-17.0	39	26	425	-20.7	30	30	410	-32.3	31	31	410	-32.3	31	31	399	-37.4	31	31	403	-34.6	31
8,000.....	27	375	-24.1	25	25	371	-27.9	29	29	355	-39.9	30	30	344	-43.7	30	30	344	-43.7	30	30	348	-41.4	30
9,000.....	27	326	-31.7	25	25	322	-35.7	24	24	307	-46.6	29	29	307	-46.6	29	29	296	-49.7	27	27	300	-47.8	27
10,000.....	26	283	-39.3	24	24	278	-42.9	20	20	263	-53.9	26	26	263	-53.9	26	26	254	-54.2	24	24	257	-52.7	24
11,000.....	25	244	-46.8	22	22	239	-50.0	12	12	226	-58.9	27	27	226	-58.9	27	27	217	-55.3	23	23	221	-54.2	23
12,000.....	21	209	-54.1	18	18	205	-56.0	6	6	192	-61.7	22	22	192	-61.7	22	22	186	-54.6	19	19	188	-53.6	19
13,000.....	14	179	-60.4	14	14	175	-60.5	14	14	175	-60.5	14	14	175	-60.5	14	14	159	-53.2	13	13	161	-53.8	13
14,000.....	6	152	-65.8	10	10	149	-62.2	6	6	149	-62.2	6	6	149	-62.2	6	6	136	-53.9	8	8	138	-54.7	8
15,000.....	6	126	-66.2	6	6	126	-66.2	6	6	126	-66.2	6	6	126	-66.2	6	6	117	-54.0	5	5	119	-56.8	5

¹ Data not yet received.

NOTE.—All observations scheduled between 10 p. m. and midnight, E. S. T. (0300 and 0500, G. C. T.), except at Mazatlan and Merida, where they are taken near 9 p. m., E. S. T. (0200, G. C. T.).

“Number of observations” refers to pressure only. (In a few cases temperature or humidity data may be missing for one or more levels of some observations.) Relative humidity data are not published for levels having a corresponding mean temperature below -20° C.

All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the values occurring below the operating range of the humidity element. For explanation of the adjustment see article entitled “Curve Method for Obtaining Monthly Means of Relative Humidity,” page 241, MONTHLY WEATHER REVIEW, December 1944.

None of the means included in these tables are based on less than 15 surface or 5 standard level observations.

TABLE 2.—Free-air resultant winds based on pilot-balloon observations made near 5 p. m., E. S. T. (2200 G. C. T.) during January 1945.
Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second

Altitude (meters) m. s. l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, D. C. (16 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. (1,627 m.)			El Paso, Tex. (1,196 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity			
Surface.....	28	168	0.5	31	296	1.8	27	288	4.3	29	234	3.5	27	305	3.1	27	277	0.5	27	107	2.3	23	293	2.9	27	274	1.3	29	265	1.1	26	300	1.2	30	338	1.6	31	260	1.6
500.....	28	246	2.0	27	289	5.1	27	273	3.7	26	312	6.5	27	248	0.1	22	169	2.1	18	288	6.1	25	290	6.7	27	275	4.9	19	271	6.5	27	275	4.9	31	262	1.6			
1,000.....	27	254	4.4	25	287	5.1	25	287	5.1	21	315	8.6	27	246	0.9	18	261	4.5	11	303	13.2	15	296	14.1	21	277	14.5	13	289	18.3	25	308	8.9	25	259	10.1			
1,500.....	25	267	7.5	31	300	1.4	22	294	11.9	29	283	10.5	18	310	11.1	21	280	10.9	31	17	261	4.5	11	303	13.2	15	296	14.1	21	277	14.5	13	289	18.3	25	308	8.9		
2,000.....	25	269	9.7	29	302	3.4	20	290	14.2	28	290	10.9	16	316	14.2	19	280	10.9	31	17	261	4.5	11	303	13.2	15	296	14.1	21	277	14.5	13	289	18.3	25	308	8.9		
2,500.....	24	271	11.9	28	301	5.8	18	288	16.7	28	293	10.5	15	314	16.4	17	286	7.8	31	14	274	11.9	10	303	13.2	15	296	14.1	21	277	14.5	13	289	18.3	25	308	8.9		
3,000.....	23	272	14.2	23	296	9.1	16	282	22.6	22	306	12.1	13	317	17.5	14	286	9.4	31	13	266	13.7	12	296	13.7	10	297	22.7	11	268	24.6	25	313	10.8	18	259	10.4		
4,000.....	21	275	15.4	21	286	11.3	15	286	26.8	18	303	10.6	12	322	20.2	12	286	9.4	31	13	266	13.7	12	296	13.7	10	297	22.7	11	268	24.6	25	313	10.8	18	259	10.4		
5,000.....	20	274	18.2	20	288	13.6	15	284	30.0	17	304	11.2	12	322	20.2	12	286	9.4	31	13	266	13.7	12	296	13.7	10	297	22.7	11	268	24.6	25	313	10.8	18	259	10.4		
6,000.....	12	301	18.1	17	286	13.9	15	284	30.0	17	304	11.2	12	322	20.2	12	286	9.4	31	13	266	13.7	12	296	13.7	10	297	22.7	11	268	24.6	25	313	10.8	18	259	10.4		
8,000.....	12	301	18.1	17	286	13.9	15	284	30.0	17	304	11.2	12	322	20.2	12	286	9.4	31	13	266	13.7	12	296	13.7	10	297	22.7	11	268	24.6	25	313	10.8	18	259	10.4		
10,000.....	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2	14	300	16.2

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (573 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity			
Surface.....	31	26	1.8	30	300	0.1	27	268	2.4	29	259	2.3	25	301	1.0	28	280	2.6	31	64	0.8	26	229	0.8	27	303	0.3	31	160	1.8	25	339	1.9	27	304	1.4	27	263	5.9
500.....	31	26	1.8	30	300	0.1	27	268	2.4	29	259	2.3	25	301	1.0	28	280	2.6	31	64	0.8	26	229	0.8	27	303	0.3	31	160	1.8	25	339	1.9	27	304	1.4	27	263	5.9
1,000.....	31	26	1.8	30	300	0.1	27	268	2.4	29	259	2.3	25	301	1.0	28	280	2.6	31	64	0.8	26	229	0.8	27	303	0.3	31	160	1.8	25	339	1.9	27	304	1.4	27	263	5.9
1,500.....	31	15	1.8	30	316	0.2	24	286	12.2	28	290	8.9	20	284	10.3	14	280	11.3	30	335	2.1	23	289	10.3	20	221	5.1	26	281	5.5	22	294	8.7	18	293	10.2	15	296	13.1
2,000.....	31	334	2.2	28	230	1.4	19	281	15.7	26	291	10.3	18	280	14.3	12	286	13.3	27	303	1.6	23	286	12.1	17	237	4.3	24	279	7.4	19	289	11.1	18	293	13.1	11	296	15.6
2,500.....	30	327	2.7	28	260	2.9	19	283	18.1	22	288	11.3	15	283	16.5	12	277	19.3	25	310	2.5	21	286	14.4	15	265	2.3	24	281	9.0	14	286	12.8	18	290	15.2	15	296	13.1
3,000.....	26	332	5.4	25	312	4.4	19	283	22.3	17	297	10.8	12	277	19.3	12	277	19.3	25	310	2.5	21	286	14.4	15	265	2.3	24	281	9.0	14	286	12.8	18	290	15.2	15	296	13.1
4,000.....	23	323	7.3	17	307	7.3	15	280	22.8	12	308	11.5	12	270	21.3	12	270	21.3	24	321	6.3	13	283	24.2	10	27	4.4	13	274	18.5	13	274	18.5	13	274	18.5	13	274	18.5
5,000.....	22	322	6.6	11	303	10.3	12	308	11.5	12	308	11.5	12	270	21.3	12	270	21.3	24	321	6.3	13	283	24.2	10	27	4.4	13	274	18.5	13	274	18.5	13	274	18.5	13	274	18.5
6,000.....	17	13	9.7	11	303	10.3	12	308	11.5	12	308	11.5	12	270	21.3	12	270	21.3	24	321	6.3	13	283	24.2	10	27	4.4	13	274	18.5	13	274	18.5	13	274	18.5	13	274	18.5
8,000.....	14	357	7.9	11	303	10.3	12	308	11.5	12	308	11.5	12	270	21.3	12	270	21.3	24	321	6.3	13	283	24.2	10	27	4.4	13	274	18.5	13	274	18.5	13	274	18.5	13	274	18.5
10,000.....	13	307	14.8	11	303	10.3	12	308	11.5	12	308	11.5	12	270	21.3	12	270	21.3	24	321	6.3	13	283	24.2	10	27	4.4	13	274	18.5	13	274	18.5	13	274	18.5	13	274	18.5
12,000.....	11	294	17.9	11	303	10.3	12	308	11.5	12	308	11.5	12	270	21.3	12	270	21.3	24	321	6.3	13	283	24.2	10	27	4.4	13	274	18.5	13	274	18.5	13	274	18.5	13	274	18.5
14,000.....	11	294	17.9	11	303	10.3	12	308	11.5	12	308	11.5	12	270	21.3	12	270	21.3	24	321	6.3	13	283	24.2	10	27	4.4	13	274	18.5	13	274	18.5	13	274	18.5	13	274	18.5

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (225 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity			
Surface.....	30	240	1.3	23	318	2.5	28	331	1.7	31	175	0.2	30	345	2.8	28	298	1.6	28	297	1.8	30	29	0.7	29	262	2.1	28	300	0.5	28	192	1.4	27	237	0.7	25	309	3.3
500.....	30	35	1.3	23	313	2.3	28	312	2.2	31	241	0.1	30	342	2.8	28	283	2.7	28	287	2.7	30	61	0.5	29	283	1.4	28	261	1.1	28	205	3.8	27	200	3.3	24	295	8.5
1,000.....	28	14	2.5	23	313	2.3	21	315	6.1	31	106	0.8	30	315	5.6	20	291	9.5	18	308	9.8	22	213	1.5	27	292	0.3	23	318	3.0	26	212	5.0	27	200	3.3	24	295	8.5
1,500.....	26	354	3.6	20	288	6.0	20	317	9.5	29	203	0.4	28	301	8.2	20	291	13.4	17	309	12.3	19	257	6.5	10	1.3	15	326	6.1	17	224	4.7	22	224	4.7	20	298	17.2	
2,000.....	25	333	3.8	18	288	6.0	16	310	13.6	28	264	1.8	25	301	10.3	17	292	13.7	16	313	14.1	19	276	7.3	22	10	1.6	14	317	9.4	15	267	5.6	13	296	19.1			
2,500.....	25	329	3.0	17	290	10.6	14	311	14.8	28	272	2.5	25	308	12.2	14	295	14.9	13	310	17.6	19																	

TABLE 3.—Maximum free air wind velocities (m. p. s.), for different sections of the United States based on pilot balloon observations during January 1945

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.)	Date	Station	Maximum velocity	Direction	Altitude (m.)	Date	Station	Maximum velocity	Direction	Altitude (m.)	Date	Station
Northeast ¹	44.2	NW.	429	24	New York, N. Y.	57.6	WNW.	4,075	5	Buffalo, N. Y.	62.7	NW.	9,592	19	Portland, Maine.
East-Central ²	52.8	NW.	1,821	24	Lynchburg, Va.	50.1	WSW.	3,090	21	Knoxville, Tenn.	75.0	WNW.	7,405	21	Knoxville, Tenn.
Southeast ³	41.2	W.	818	23	Charleston, S. C.	45.0	WNW.	4,873	31	Birmingham, Ala.	85.0	WNW.	11,022	11	Charleston, S. C.
North-Central ⁴	39.4	NW.	1,608	23	Duluth, Minn.	54.0	NNW.	4,080	24	S. Ste. Marie, Mich.	64.8	NW.	5,710	23	St. Paul, Minn.
Central ⁵	40.8	N.	2,500	10	Wichita, Kans.	47.2	NW.	4,311	23	St. Louis, Mo.	64.0	WNW.	6,206	1	St. Louis, Mo.
South-Central ⁶	37.9	WNW.	2,260	19	Lake Charles, La.	48.0	NW.	4,783	1	Little Rock, Ark.	65.0	WSW.	13,315	26	San Antonio, Tex.
Northwest ⁷	37.9	WNW.	1,640	13	Glasgow, Mont.	56.0	W.	4,979	13	Great Falls, Mont.	78.8	NW.	9,653	8	Glasgow, Mont.
West-Central ⁸	33.3	NW.	2,489	8	Cheyenne, Wyo.	45.5	NW.	3,716	8	Pueblo, Colo.	60.0	WNW.	10,248	21	Oakland, Calif.
Southwest ⁹	26.4	WNW.	2,500	24	El Paso, Tex.	43.5	WNW.	4,915	21	Raton, N. Mex.	59.6	WNW.	9,113/9,393	19	Red Bluff, Calif.
													9,638	20	Santa Maria, Calif.

¹ Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.

² Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.

³ South Carolina, Georgia, Florida, and Alabama.

⁴ Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.

⁵ Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.

⁶ Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.

⁷ Montana, Idaho, Washington, and Oregon.

⁸ Wyoming, Colorado, Utah, northern Nevada, and northern California.

⁹ Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By C. R. JORDAN

PRECIPITATION was above normal during January in southern Texas, the central Great Plains, the Northeast, much of the Florida Peninsula, and a few scattered local areas. Rainfall was notably deficient over a large area from the Lake region southward over the Ohio Valley and in the area from Montana southwestward through California.

No severe or extensive flooding occurred during the month but light to moderate flooding was reported at widely scattered points throughout the country. Drought conditions continue in a large area from Arkansas to the Great Lakes with conditions particularly acute in Ohio and Indiana.

An above-normal snow cover has accumulated during the winter in Pennsylvania, New York, and New England and in some locations, the water on the ground in form of snow at the end of January was nearly as great and in some cases greater than the accumulation prior to the unprecedented floods of March 1936. Several periods of mild weather and moderate rainfall during February served to eliminate much of the snow cover in Pennsylvania and western and southern New York. Only minor flooding resulted in the upper Ohio River drainage and in portions of the Susquehanna Basin. The snow depths in northeastern New York and in central and northern New England decreased slightly in February but the density increased and in some instances there was an actual increase in water content.

The large accumulation of snow in the Northeast up to early in February resulted from a moderately above normal precipitation, but especially from persistent cold

Average snow depths and water equivalents over representative basins on January 31 or early February

Basin	Average snow depth	Average water content
	Inches	Inches
Penobscot (headwaters)	30	7.00
Androscoggin (headwaters)	35	8.60
Saco (headwaters)	40	8.85
Merrimack (above Concord, N. H.)	28	5.00
Connecticut:		
(In valley areas)	24-36	4 to 5
(In mountain areas)	30-60	6 to 8
Sacandaga	30	5.90
Lehigh	19	3.40
Susquehanna:		
(Above Towanda, Pa.)	17	4.40
(Below Towanda, Pa.)	16	3.50
Allegheny:		
(Above Warren, Pa.)	30	6.50
(Below Warren, Pa.)	22	4.00
Monongahela:		
(Above Morgantown, W. Va.)	5	1.00
(Below Morgantown, W. Va.)	12	2.50

without thaw. The precipitation from November 1944 through January 1945, ranged from 102 percent in Pennsylvania to 114 percent of normal in New England. Temperatures on the other hand ranged from 2 to 4 degrees below normal. Reports indicate little or no frozen ground in the regions of heavy snow cover.

Atlantic Slope Drainage.—There was some light overflow of the Pemigewasset River at Plymouth, N. H., on January 2 that resulted for the most part from backwater from an ice gorge below the gage. The Schuylkill River at Philadelphia, Pa.; the James River at Columbia, Va.; and the Roanoke River at Weldon and Williamston, N. C., exceeded flood stages slightly during the early part of the month. Overflow was very local and no damage was reported.

East Gulf of Mexico Drainage.—Moderate to heavy general rain over the upper Tombigbee watershed during the last week of December 1944 produced a steady rise in the Tombigbee River. Flood stage was slightly exceeded at Lock No. 3 on the 4th and 5th after which the stream receded slowly until heavy rains on January 6-7 started a second rise in both the Warrior and Tombigbee Rivers. The Tombigbee River at Lock No. 3 exceeded flood stage by several feet. The only damage reported occurred north of Aberdeen, Ala., where it is estimated that damage to roads and bridges amounted to \$1,000.

The rainfall of January 6-7 also caused the Pearl River to rise slightly above flood stage at Pearl River, La., but no damage was reported.

MISSISSIPPI SYSTEM

Ohio Basin.—A few days of warm weather at the end of December followed by moderately heavy rain over the Ohio Valley on December 31-January 1 produced sharp rises in the main stream and tributaries with light to moderate flooding at a number of points throughout the basin as shown by the table at the end of this report. Overflow was not serious. High stages in the Green and Barren Rivers were aggravated and prolonged by additional rain on January 7-8. Some loss, consisting chiefly of matured crops of corn, were reported in the upper Green and Barren Rivers. There were also some losses of crops and livestock and damage to highways, bridges, etc., in the Cumberland River Basin. Losses were estimated at \$14,500 in the Green and Barren basins and \$40,950 in the Cumberland Basin.

Red Basin.—The Ouachita River at Camden, Ark., was above flood stage from December 29 to January 10, as a result of heavy rains in the area during the last week of December.

Light overflow of the Sulphur River at Hagensport and Naples, Tex., and the Cypress River at Jefferson, Tex., occurred at the same time.

Lower Mississippi Basin.—Moderate to heavy rains in western Tennessee from December 27 through 31, amounting to about 9 inches, caused the Wolf River to rise steadily to a crest of 11 feet on January 2 at Rossville, Tenn. Loss resulting from the overflow amounted to \$1,800.

During the same period, rainfall over the upper Yazoo Basin averaged about 8 inches with a few stations reporting totals of more than 10 inches. Flood stages were passed on the Coldwater River at Sarah, Miss., and the Tallahatchie River at Swan Lake, Miss. Damage resulting from this overflow was estimated at \$10,000 and was confined mostly to highways and bridges with some loss due to suspension of business.

West Gulf of Mexico Drainage.—Heavy rains on December 30-31 and again on January 17-18 caused sharp rises in streams already high for the season in eastern Texas and western Louisiana and flood stages were exceeded at scattered stations along the Calcasieu, Sabine, Trinity, and Guadalupe Rivers. Overflow was not serious and little damage was reported. Losses to livestock and other movable property in the vicinity of Liberty, Tex., were estimated at \$5,000.

Pacific Slope Drainage.—Moderate rain augmented by water from melting snow produced above average stream flow in Oregon during January. The Santiam River just reached flood stage at Jefferson, Oreg., on the night of January 7-8. Otherwise, no flooding occurred.

FLOOD STAGE REPORT FOR JANUARY 1945

[All dates in January unless otherwise specified]

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Pemigewasset: Plymouth, N. H.	11	2	3	13.2	2
Schuylkill: Philadelphia, Pa.	11	1	1	11.1	1
James: Columbia, Va.	10	2	4	12.8	3
Roanoke:					
Weldon, N. C.	31	3	4	32.0	3
Williamston, N. C.	10	7	20	10.8	12-14
EAST GULF OF MEXICO DRAINAGE					
Tombigbee: Lock No. 3, Ala.	33	{ 4 7 16	5 15 16	33.3 40.6 33.0	4 11 16
Pearl: Pearl River, La.	12	11	15	12.9	13
MISSISSIPPI SYSTEM					
Ohio Basin					
West Fork:					
Weston, W. Va.	15	1	2	17.0	2
Clarksburg, W. Va.	5	1	1	6.2	1
Monongahela:					
Lock No. 7, Greensboro, Pa.	30	1	1	30.2	1
Lock No. 6.	19.5	2	2	20.5	2
Lock No. 2.	20.5	1	3	25.4	2
Little Kanawha:					
Glenville, W. Va.	23	1	2	25.7	1
Creston, W. Va.	20	1	2	22.4	1
Elk: Clay, W. Va.	18			18.6	1
Barren: Bowling Green, Ky.	28	1	5	30.5	3
Green:					
Munfordville, Ky.	28	1	5	30.5	3
Lock No. 6, Brownsville, Ky.	28	1	6	35.2	4
Lock No. 4, Woodbury, Ky.	33	{ Dec. 31 16	11 16	44.9 33.0	5 16
Lock No. 2, Rumsey, Ky.	34	4	21	39.2	11-12
Cumberland:					
Celina, Tenn.	28	Dec. 31	6	38.8	4
Nashville, Tenn.	40	1	7	43.1	2
Clarksville, Tenn.	46	1	10	50.0	3
Lock F, Eddyville, Ky.	50	3	13	56.5	10
Duck: Columbia, Tenn.	32	1	2	33.2	1
Ohio:					
Dam No. 47, Newburgh, Ind.	38	4	9	40.1	7
Evansville, Ind.	37	7	8	37.5	7
Shawneetown, Ill.	33	7	10	33.9	9
Dam No. 50, Fords Ferry, Ky.	34	6	12	36.1	9
Dam No. 52, Brookport, Ill.	37	5	5	37.1	5
Red Basin					
Ouachita: Camden, Ark.	26	Dec. 29	10	34.4	3
Sulphur:					
Hagensport, Tex.	38	{ Dec. 27 19	1 19	39.7 38.4	Dec. 28 19
Naples, Tex.	22	{ Dec. 30 24	8 28	26.8 23.0	2 27
Cypress: Jefferson, Tex.	18	Dec. 31	7	21.0	3
Lower Mississippi Basin					
Wolf: Rossville, Tenn.	10	Dec. 31	3	11.05	2
Coldwater: Sarah, Miss.	18	1	1	18.8	1
Tallahatchie: Swan Lake, Miss.	26	1	30	30.8	6
WEST GULF OF MEXICO DRAINAGE					
Calcasieu: Kinder, La.	16	Dec. 29	5	{ 16.4 16.3	Dec. 29 3
Sabine:					
Gladewater, Tex.	26	1	12	31.4	7
Logansport, La.	25	{ 1 18	14 29	29.3 30.3	7 23
Bon Wier, Tex.	17	1	(?)	{ 20.5 20.0	10-11 20
East Fork: Rockwall (nr.), Tex.	10	{ Dec. 28 20	1 23	12.7 11.8	Dec. 31 21
Trinity:					
Liberty, Tex.	24	{ Dec. 31 20	14 28	26.7 26.6	4-5 23
Trinidad, Tex.	28	Dec. 30	2	30.1	2
Guadalupe:					
Gonzales, Tex.	20	19	20	26.3	20
Victoria, Tex.	21	21	23	23.7	23
PACIFIC SLOPE DRAINAGE					
Columbia Basin					
Santiam: Jefferson, Oreg.	13	7	8	13.1	7-8

¹ Provisional.

² Ice gorge below gage.

³ Continued into February.

CLIMATOLOGICAL DATA

CONDENSED CLIMATOLOGICAL SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS

[For description of tables and charts, see Review, January 1943, p. 15]

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Section	Temperature								Precipitation							
	Section average	Departure from the normal	Monthly extremes						Section average	Departure from the normal	Greatest monthly		Least monthly			
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount		
° F.	° F.	° F.				° F.		In.	In.							
Alabama	46.9	+0.4	Geneva	77	19	Valley Head	13	31	4.00	-0.85	Bay Minette	6.43	Dancy	1.79		
Arizona	42.2	+2	Mohawk	82	7	Alpine	-13	29	1.30	.00	Junipine	4.35	Springerville	.17		
Arkansas	40.2	-1.0	Perryville	80	14	Lead Hill	7	29	2.37	-1.87	Arkansas City	6.08	Evening Shade	.63		
California	44.4	-3	Indio	88	13	Elery Lake	-18	20	1.17	-3.63	Crescent City (near)	8.36	9 stations	.00		
Colorado	26.2	+2.3	Eversoll Ranch	72	9	Taylor Park	-30	22	.87	+0.08	Wolf Creek Pass	4.36	Monte Vista	.21		
Florida	58.0	-9	Bartow	88	8	2 stations	25	10	3.87	+1.09	Pensacola	8.39	St. Lucie Lock No. 2	.81		
Georgia	46.4	-5	3 stations	78	19	Blairsville	11	30	3.29	-94	Bainbridge	5.97	Augusta Airport	1.33		
Idaho	27.4	+3.4	do.	65	7	3 stations	-21	22	1.59	-54	Deception Creek	9.17	Lifton	.06		
Illinois	24.0	-3.7	Harrisburg	60	12	Freeport	-17	19	1.08	-1.21	Brookport	3.28	Hudson	.32		
Indiana	23.8	-5.2	5 stations	49	15	LaPorte	-14	2	1.13	-1.85	Evans Landing	3.67	Frankfort	.29		
Iowa	19.3	+6	2 stations	49	13	Decorah	-26	10	.67	-41	Bloomfield	2.12	Primghar	.22		
Kansas	32.6	+2.6	3 stations	68	19	Syracuse	-9	30	.88	+19	Pratt	2.06	Burlington	.30		
Kentucky	31.8	-3.9	2 stations	60	11	2 stations	-3	2	4.05	-29	Munfordville	7.43	LaGrange	1.76		
Louisiana	50.2	-1.3	do.	78	25	5 stations	22	10	4.76	-09	Jeanerette	7.72	Burrwood	1.16		
Maryland-Delaware	28.3	-4.8	Bridgeville, Del.	62	1	Oakland, Md.	-16	27	3.26	-09	Wilmington, Del.	4.99	Cumberland, Md.	1.40		
Michigan	15.3	-5.6	2 stations	41	12	2 stations	-34	6	1.13	-82	Calumet	5.48	St. Charles	.06		
Minnesota	11.0	+1.4	3 stations	43	11	Big Falls	-41	5	.63	-12	Red Wing	1.17	2 stations	.13		
Mississippi	46.3	-9	Monticello	77	1	7 stations	18	2	4.47	-52	Greenville	9.24	Jackson	2.50		
Missouri	30.0	-8	2 stations	65	13	Albany	-12	31	1.08	-1.22	Deering	3.52	Harrisonville	.23		
Montana	24.3	+4.7	do.	60	14	Turner	-31	1	.75	-17	Trout Creek	3.81	2 stations	T		
Nebraska	27.8	+4.6	Gothenburg	64	12	Gordon	-24	1	.50	-04	Broken Bow	1.14	Spencer	.07		
Nevada	31.6	+1.9	4 stations	74	18	Fish Creek Ranch	-23	29	.46	-73	Sheldon	1.65	5 stations	.00		
New England	16.8	-5.6	Taunton, Mass.	61	1	Lemington, Vt.	-32	11	3.80	+39	Pinkham Notch, N. H.	6.34	Bethlehem, N. H.	1.77		
New Jersey	24.4	-6.5	Burlington	60	1	Long Valley	-10	26	3.02	-63	Elizabeth	6.27	Clayton	1.71		
New Mexico	33.9	+4	Pearl (near)	79	8	Eagle Nest	-46	29	.79	+20	Rutledge Ranch	3.04	Riverside Camp	.00		
New York	14.6	-8.3	Setauket	58	1	2 stations	-38	16	3.18	+30	Donnattsburg	5.72	Ogdensburg	.72		
North Carolina	39.6	-2.5	2 stations	70	1	Mount Mitchell	-6	31	2.16	-1.62	Andrews	3.54	Kinston	.97		
North Dakota	12.7	+5.9	Medora	51	24	2 stations	-31	8	.41	-06	Grafton	1.15	Foxholm	.08		
Ohio	21.6	-6.8	2 stations	48	1	Mansfield	-13	11	1.63	-1.34	Dam No. 28	4.90	2 stations	.46		
Oklahoma	39.1	+9	Crescent	76	14	Kenton	1	28	1.38	-04	Grandfield	2.85	Wyandotte	.25		
Oregon	34.5	+2.7	Lacomb	68	7	Danner	-10	22	2.94	-82	Valsetz	19.12	Plush	.13		
Pennsylvania	44.8	-1.1	Walterboro	78	14	Caesars Head	10	2	2.48	-1.06	Camden	4.60	2 stations	1.44		
South Carolina	21.7	+4.8	Pine Ridge	59	13	Camp Crook	-26	31	.53	-03	Dumont	1.55	Siseton	.02		
South Dakota	37.2	-1.8	4 stations	67	25	Crossville	-1	2	4.09	-63	Jackson No. 2	8.67	Etowah	1.60		
Tennessee	48.1	-1	2 stations	88	127	Dalhart	5	22	2.04	+23	Conroe	6.97	Ballinger	.00		
Texas	29.4	+4.2	Zion National Park	68	9	Pangulitch	-14	30	.66	-57	Bryce Canyon	2.13	Plute Dam	T		
Utah	33.3	-3.1	Diamond Springs	66	1	Big Meadows	-2	31	2.44	-80	Moores Creek Dam	5.30	Mount Weather	1.24		
Virginia	35.2	+4.7	2 stations	65	17	2 stations	-6	20	4.66	+02	Wishkah Headworks	23.08	Moxee	.35		
Washington	28.4	-4.2	do.	60	1	Brandonville	-14	27	3.28	-29	Midvale	6.34	Wardensville	1.14		
Wisconsin	13.0	-2.3	Wisconsin Dells	43	23	Mellen	-38	5	.66	-57	Vieux des Sert	1.61	Oconomowoc	.26		
Wyoming	22.8	+2.9	Dubois	62	9	Moran	-30	21	.61	-18	Grassy Lake Dam	4.41	Red Bird	.06		
Alaska (December)	11.3	+5.9	Japonski	65	10	Allakaket	-59	6	2.62	+11	Little Port Walter	27.33	Point Lay	.15		
Hawaii	69.5	+7	Waianae	88	14	Haleakala	36	22	1.26	-7.19	Nonomaele	7.11	20 stations	.00		
Hawaii (December)	69.7	-4	2 stations	88	1	do.	37	1	6.76	-1.74	Kukul	32.00	Puu Mall	.40		
Puerto Rico	72.5	-1.0	Juana Diaz	95	7	Cayey	46	9	2.79	-88	Matrullas Dam	10.19	Aguirre	.20		

1 Other dates also.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments			Pressure		Temperature of the air										Precipitation	Wind					Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms							
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal	Mean	Departure from normal	Maximum	Date	Mean maximum	Minimum	Date	Mean minimum	Greatest daily range		Total degree days	Mean temperature of the dew-point	Mean relative humidity	Total	Departure from normal							Greatest in 24 hours	Days with 0.01 inch or more	Average hourly velocity	Prevailing direction	Maximum velocity		
																																Miles per hour	Direction	Date
New England																																		
Eastport	75	67	85	1,007.8	1,011.2	-4.7	19.8	-0.6	54	1	28	-7	11	12	30	1,399	12	72	4.47	+0.6	1.22	19	14.4	nw.	44	s.	1	9	8	14	6.2	23.4	12.5	0
Greenville, Maine	1,070	6	41	971.2	1,013.2	7.9	-4.5	52	1	18	-24	11	-2	46	1,769	5	83	4.48	+1.6	1.37	13	10.1	n.	41	s.	1	6	10	15	34.7	35.0	0	0	
Portland, Maine	103	5	45	1,008.5	1,012.9	-4.7	16.0	-6.4	53	1	27	-18	26	5	46	1,516	10	83	3.88	-1.1	1.28	12	10.1	n.	41	s.	1	10	8	13	5.7	27.8	12.8	0
Concord	289	5	45	1,002.7	1,014.2	-3.4	15.4	-3.6	53	1	26	-20	11	5	48	1,537	8	75	3.61	+0.6	0.96	10	9.8	nw.	37	nw.	26	13	7	11	5.4	33.2	19.3	0
Burlington	403	5	51	1,000.0	1,015.9	-1.7	10.0	-8.8	44	1	19	-18	26	0	36	1,703	4	85	2.97	+1.2	1.46	16	8.8	nw.	37	s.	12	5	9	17	6.9	18.7	19.0	0
Boston	124	33	62	1,008.5	1,013.9	-3.7	23.8	-4.1	59	1	31	-4	25	16	26	1,280	14	66	3.67	+1.1	0.90	13	14.4	nw.	56	sw.	1	10	8	13	5.9	24.3	7.2	0
Nantucket	12	11	59	1,012.2	1,013.2	-4.1	28.4	-2.9	54	1	35	2	25	22	29	1,133	22	77	4.38	+0.1	0.23	13	12.2	nw.	42	sw.	1	11	7	13	5.8	3.8	0	0
Block Island	26	11	46	1,012.5	1,013.9	-4.4	26.8	-4.2	56	1	33	1	25	20	29	1,183	20	76	3.46	+0.3	0.40	13	20.8	nw.	63	nw.	24	14	5	12	5.1	6.8	0	0
Providence	159	46	60	1,007.8	1,014.6	-3.4	24.4	-2.8	59	1	32	-3	25	17	30	1,255	12	65	4.08	+0.4	0.72	11	10.0	nw.	45	sw.	1	11	7	13	5.5	20.1	3.5	0
Hartford	159	5	44	1,008.8	1,015.6	-2.7	20.2	-5.3	55	1	30	-4	25	11	34	1,390	11	72	3.75	-2.1	1.15	11	9.7	nw.	39	s.	1	13	6	12	5.5	20.1	11.5	1
New Haven	107	5	39	1,010.8	1,015.6	-3.0	23.3	-4.1	55	1	32	-4	25	15	31	1,294	14	68	2.23	-1.4	0.60	12	8.9	nw.	34	nw.	1	13	9	9	5.4	12.9	2.2	0
Middle Atlantic																																		
Albany	97	26	40	1,012.5	1,016.6	-1.7	14.0	-6.1	46	1	22	-12	26	6	30	1,584	8	78	3.25	+0.8	1.12	10	10.6	w.	37	w.	23	10	9	12	5.9	35.4	14.3	0
Binghamton	871	60	79	983.7	1,017.6	-1.0	16.5	-7.6	47	1	25	-12	26	8	30	1,504	10	85	4.07	+1.6	1.41	17	6.4	w.	27	w.	24	5	11	15	6.9	46.1	24.0	0
New York	314	415	454	1,003.7	1,016.6	-2.7	25.4	-5.5	55	1	33	0	25	17	30	1,228	14	62	3.25	-4.1	1.13	8	18.1	nw.	61	nw.	24	12	11	8	5.1	11.4	6.0	0
Harrisburg	374	30	49	1,003.4	1,018.3	-1.0	23.9	-5.1	45	4	31	4	25	16	27	1,277	16	70	3.34	+2.1	1.74	10	8.4	nw.	34	nw.	24	6	9	16	6.9	31.4	11.0	0
Philadelphia	114	5	57	1,012.9	1,018.0	-1.6	24.8	-6.3	58	1	32	2	25	18	34	1,247	18	74	2.86	-4.1	1.17	10	9.8	nw.	39	nw.	24	10	7	14	6.2	11.7	4	0
Reading	323	47	306	1,005.1	1,018.3	-2.4	24.3	-6.8	52	1	32	0	25	17	30	1,200	20	69	2.83	-1.7	0.74	8	16.8	w.	50	s.	1	10	5	16	6.1	1.1	0	0
Seranton	805	72	104	987.1	1,018.3	-7.7	18.9	-7.7	48	1	26	-5	25	12	27	1,430	20	63	2.28	-1.0	0.77	10	10.4	nw.	34	nw.	24	12	6	13	5.8	8.0	9.0	0
Atlantic City	52	37	172	1,014.9	1,017.3	-2.3	29.2	-3.3	53	1	36	4	25	22	24	1,107	20	69	2.83	-1.7	0.74	8	16.8	w.	50	s.	1	10	5	16	6.1	1.1	0	0
Trenton	190	89	107	1,009.8	1,017.6	-1.7	30.8	-2.6	55	1	37	11	25	24	29	1,062	19	62	2.89	-2.1	1.02	11	8.5	n.	31	nw.	1	8	6	17	6.6	3.3	0	0
Baltimore	123	100	215	1,013.2	1,018.3	-1.7	30.4	-3.4	51	4	36	11	25	24	26	1,072	18	64	3.75	+2.1	1.84	11	10.5	sw.	35	nw.	24	10	8	13	5.7	9.8	1.5	0
Washington	112	56	100	1,013.9	1,018.6	-1.7	30.8	-2.6	55	1	37	11	25	24	29	1,062	19	62	2.89	-2.1	1.02	11	8.5	n.	31	nw.	1	8	6	17	6.6	3.3	0	0
Cape Henry	18	8	54	1,016.6	1,018.0	-2.3	34.0	-3.5	54	1	42	23	25	31	30	879	29	74	1.88	-1.3	0.53	13	12.8	n.	37	n.	25	8	11	12	6.2	T	0	1
Lynchburg	686	4	50	992.2	1,018.0	-2.3	34.0	-3.5	54	1	42	23	25	31	30	879	29	74	1.88	-1.3	0.53	13	12.8	n.	37	n.	25	8	11	12	6.2	T	0	1
Norfolk	91	80	125	1,014.6	1,018.6	-1.7	37.8	-2.8	65	1	44	20	25	32	29	843	28	74	1.72	-1.4	0.48	11	9.6	n.	31	w.	1	7	9	15	6.3	T	0	1
Richmond	144	11	52	1,012.2	1,018.0	-2.7	35.0	-2.9	61	1	42	16	27	28	31	930	26	73	2.22	-1.0	0.97	10	8.1	nw.	32	sw.	1	7	10	14	6.3	5	0	0
South Atlantic																																		
Asheville	2,253	77	92	936.7	1,019.3	-1.7	37.0	+1.6	55	27	46	14	31	28	39	870	26	72	1.76	-1.3	0.83	9	9.2	nw.	26	nw.	24	7	8	16	6.4	T	0	0
Charlotte	779	63	86	989.5	1,018.6	-2.4	42.0	+0.8	61	28	50	22	2	34	33	717	32	76	2.08	-1.9	0.74	9	6.7	s.	28	sw.	1	10	5	16	6.0	0	0	0
Greensboro	886	6	86	985.4	1,018.6	-3.7	37.6	+0.3	59	1	47	17	30	28	33	849	29	77	1.90	-1.7	0.69	7	7.9	sw.	32	s.	1	11	3	17	6.0	T	0	0
Hatteras	11	5	50	1,017.3	1,018.0	-2.7	42.7	-4.4	70	1	49	28	31	36	27	689	38	86	2.90	-1.5	1.31	11	13.6	n.	38	w.	1	9	9	13	6.0	T	0	2
Raleigh	376	5	69	1,004.4	1,018.6	-1.7	39.7	-1.4	63	1	47	23	31	32	30	784	30	78	1.43	-2.2	0.86	8	7.1	nw.	34	sw.	1	10	9	12	6.0	T	0	1
Wilmington	72	73	107	1,015.2	1,018.3	-2.4	45.4	-1.1	68	1	53	29	27	37	27	609	38	78	2.08	-1.2	0.81	10	8.7	nw.	39	sw.	1	13	5	13	5.2	0	0	0
Charleston	48	11	92	1,016.6	1,018.6	-2.4	49.2	-1.7	66	8	57	30	2	42	23	488	39	83	1.55	-1.5	0.43	9	9.1	w.	34	w.	1	12	8	11	5.2	0	0	0
Columbia, S. C.	347	70	91	1,008.4	1,018.6	-2.4	46.3	+0.3	63	28	55	26	2	38	29	580	36	78	1.63	-1.8	0.68	12	7.6	s.	33	sw.	1	12	8	11	5.2	0	0	0
Greenville, S. C.	1,040	18	36	980.0	1,018.0	-2.7	47.4	+0.4	66	1	57	26	2	38	32	546	34	66	1.46	-2.5	0.43	10	5.8	nw.	27	nw.	1	9	11	11	5.5	0	0	0
Augusta	182	62	77	1,011.9	1,018.6	-2.7	47.4	+0.4	66	1	57	26	2	38	32	546	34	66	1.46	-2.5	0.43	10	5.8	nw.	27	nw.	1	9	11	11	5.5	0	0	0
Savannah	65	73	152	1,016.6	1,019.3	-1.7	51.8	+0.4	70	19	61	30	2	42	26	412	40	82	1.88	-0.9	0.70	7	11.0	nw.	38	nw.	1	13	8	10	4.9	0	0	0
Jacksonville	43	86	110	1,018.0	1,020.0	-1.0	54.7	-0.7	75	19	64	35	2	46	26	322	44	82	5.26	+2.5	2.96	9	8.4	nw.	27	nw.	1	9	11	11	5.3	0	0	1
Florida Peninsula																																		
Key West	21	10	64	1,018.0	1,019.3	-0.69	0	-5	81	7	74	56	11	64	15	10	61	82	1.04	-0.9	0.95	4	9.2	n.	31	w.	8	13	13	5	4.4	0	0	1
Miami	25	242	249	1,017.6	1,019.3	-1.3	65.6	-2.3	78	23	72	43	10	59	24	56	56	84	1.93	-3.1	1.26	6	12.5	nw.	29	w.	26	16	8	7	4.4	0	0	0
Tampa	35	6	43	1,018.3	1,020.0	-0.59	8	-6	77	20	68	41	17	51	28	170	50	80	4.05	+1.4	3.49	8	9.8	n.	33	s.	7	7	13	11	5.6	0	0	1
East Gulf																																		
Atlanta	1,173	33	72	976.3	1,019.3	-1.7	43.2</																											

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments			Pressure			Temperature of the air										Precipitation	Wind			Show, sleet, and ice on ground at end of month	Number of days with thunderstorms							
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal	Mean	Departure from normal	Maximum	Date	Mean maximum	Minimum	Date	Mean minimum	Greatest daily range	Total degree days		Mean temperature of the dew-point	Mean relative humidity	Total			Departure from normal	Greatest in 24 hours	Days with 0.01 inch or more	Average hourly velocity	Prevailing direction	Maximum velocity	
																												Miles per hour	Direction
Ohio Valley and Tennessee	ft.	ft.	ft.	mb.	mb.	mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	in.	in.	in.	mi.							
Chattanooga ¹	762	6	66	991.5	1,020.3	-1.0	39.0	-1.1	60	26	49	17	11	29	33	808	30	78	2.44	-2.8	.93	10	7.9	n.	29	nw.	22	0	
Knoxville ¹	995	27	53	983.1	1,020.0	-1.0	38.0	-1.3	56	12	47	14	31	29	31	830	30	77	2.18	-2.5	.56	12	6.4	ne.	27	nw.	8	0	
Memphis ⁴	399	5	86	1,005.8	1,020.7	-0.6	39.2	-0.5	66	25	48	19	2	31	32	797	33	81	2.95	-1.9	.78	8	8.0	n.	27	nw.	8	0	
Nashville ¹	546	5	72	1,000.0	1,020.3	-1.0	36.0	-2.6	57	25	44	10	2	28	29	900	30	80	3.47	-1.3	1.17	10	8.2	n.	25	n.	9	0	
Lexington ¹	989	4	28	982.7	1,020.3	-0.28	46	-4.6	21	36	-1	2	2	22	26	1,130	24	86	3.05	-1.1	.87	13	8.1	n.	27	nw.	4	0	
Louisville ¹	525	106	120	1,000.7	1,020.7	-0.30	40	-4.0	45	12	37	5	2	24	26	1,070	24	80	1.88	-2.1	.64	14	8.7	n.	27	nw.	12	7	
Evansville ¹	431	11	40	1,004.4	1,021.0	+3.29	8	-1.8	48	20	37	0	31	22	34	1,096	24	84	1.89	-1.8	.73	13	7.9	n.	26	w.	1	4	
Indianapolis ¹	823	5	54	989.2	1,020.7	+7.22	8	-4.5	44	12	33	-3	31	15	36	1,305	18	84	.67	-1.3	1.13	10	10.2	w.	34	w.	1	5	
Terre Haute ¹	575	68	149	990.3	1,021.3	+26.4	-3.4	48	12	33	2	31	20	26	1,195	20	82	.63	-2.1	.22	8	9.1	w.	28	w.	1	5		
Cincinnati ¹	627	11	51	996.3	1,020.7	+7.26	-1.2	42	12	32	3	2	20	28	1,204	21	80	1.58	-1.9	.36	13	7.5	w.	32	sw.	22	5		
Columbus ¹	822	90	110	988.5	1,020.0	+4.23	-7.7	49	12	30	0	2	18	32	1,283	18	83	.93	-2.1	.23	11	9.8	n.	32	sw.	1	3		
Dayton ¹	1,003	6	55	982.1	1,020.0	-21.6	-6.1	38	12	38	-1	2	15	30	1,417	18	86	.64	-2.6	.17	11	11.1	w.	33	sw.	1	6		
Elkins ¹	1,947	4	45	946.8	1,019.3	-7.25	-3.4	55	1	34	-4	27	16	45	1,232	22	90	2.49	-1.0	.98	22	7.4	w.	38	w.	1	1		
Parkersburg ¹	637	77	84	995.6	1,020.0	-0.27	-5.3	45	12	34	5	2	21	28	1,171	22	80	2.41	-1.2	.37	16	6.9	nw.	26	nw.	24	2		
Pittsburgh ¹	842	39	54	986.8	1,018.6	-1.0	22.0	-6.2	41	12	29	0	2	15	33	1,340	18	86	3.02	0	.98	23	9.8	nw.	36	nw.	24	5	
Lower Lakes							16.3	-7.5									86	2.10	-0.5										
Buffalo ¹	768	34	96	988.2	1,018.0	-0.3	16.2	-7.7	38	1	24	-8	25	9	27	1,514	13	89	3.71	+4	.83	19	14.4	w.	43	w.	1	5	
Canton	448	10	61	999.3	1,017.3	-0.6	6.6	-10.0	36	1	16	-31	6	-3	31	1,809	5	98	2.63	+1	.85	19	9.0	w.	34	w.	2	10	
Oswego	335	71	85	1,001.1	1,017.3	-1.0	16.6	-7.0	38	1	24	-9	6	9	24	1,502	10	75	3.14	+2	.59	24	10.9	nw.	32	n.	16	3	
Rochester ¹	523	5	69	997.6	1,018.0	-0.3	15.2	-8.0	37	12	23	-7	25	7	29	1,542	10	82	2.50	+4	.45	23	12.2	w.	42	w.	1	4	
Syracuse ¹	596	5	57	993.9	1,017.6	-0.7	14.4	-8.4	41	1	24	-15	18	5	33	1,568	10	86	4.26	+1.5	1.28	22	10.8	sw.	42	s.	12	1	
Erie ¹	714	57	81	991.9	1,019.3	+7.19	19.4	-7.4	40	12	26	0	25	13	26	1,413	14	89	3.01	+2	1.07	21	8.9	w.	27	w.	1	13	
Cleveland ¹	762	27	54	990.2	1,019.6	+6.18	18.8	-5.9	41	12	27	-4	25	11	30	1,430	16	90	1.21	+3	.59	18	10.7	sw.	38	w.	1	3	
Tandusky	629	5	67	995.3	1,020.0	+1.0	19.8	-6.5	42	12	27	-2	2	13	30	1,402	13	85	1.10	-1.2	.42	16	9.2	sw.	27	w.	1	8	
Toledo ¹	628	5	47	995.6	1,020.0	+1.3	16.7	-7.8	40	12	25	-6	27	8	32	1,496	13	85	.51	-1.6	.12	13	11.4	sw.	34	w.	1	7	
Fort Wayne ¹	857	5	33	987.1	1,020.0	-18.0	-7.4	39	12	25	-8	2	11	41	1,456	14	86	.61	-1.7	.27	11	8.9	w.	31	w.	23	3		
Detroit ¹	730	5	78	991.5	1,020.0	+1.4	17.8	-6.3	40	12	24	-2	2	12	24	1,465	14	80	.45	-1.6	.14	11	9.8	nw.	34	w.	1	3	
Upper Lakes							14.6	-2.9									80	6.70	-1.1										
Alpena	609	5	89	994.9	1,019.0	+1.7	14.5	-4.6	35	22	22	-9	6	8	31	1,565	10	84	.91	-1.0	.20	19	10.2	nw.	34	nw.	24	0	
Escanaba	612	51	72	995.9	1,020.0	+2.4	12.9	-2.5	31	21	20	-13	5	6	31	1,617	8	83	.66	-8	.22	12	10.1	nw.	33	nw.	22	7	
Grand Rapids ¹	707	70	244	992.2	1,019.0	+1.6	20.0	-4.5	39	12	26	-5	2	15	31	1,390	15	84	.43	-1.9	.11	11	10.9	w.	40	sw.	23	1	
Lansing ¹	878	5	90	985.8	1,019.6	-17.2	-6.2	39	12	23	-2	2	11	30	1,453	12	82	.55	-1.3	.12	11	8.3	w.	26	sw.	12	2		
Marquette	734	44	73	990.5	1,019.0	+1.7	14.6	-1.7	31	20	-6	5	9	22	1,585	8	76	1.28	-1.0	.31	17	8.6	w.	26	nw.	22	1		
Sault Sainte Marie ¹	614	11	52	994.6	1,019.0	+2.1	7.2	-4.9	30	19	16	-20	13	-1	28	1,793	3	82	.94	-1.1	.18	19	10.5	e.	30	nw.	1	5	
Chicago ¹	673	5	36	994.6	1,020.7	+1.4	19.2	-3.1	40	12	26	-8	9	13	40	1,415	15	83	.80	-1.1	.35	11	9.4	w.	27	w.	1	4	
Green Bay	617	90	123	996.3	1,020.3	+2.3	14.0	-1.7	36	23	21	-11	2	7	29	1,578	6	68	.52	-1.0	.13	9	9.7	w.	27	nw.	23	5	
Milwaukee ¹	681	33	66	993.9	1,020.3	+1.7	17.4	-2.0	36	12	24	-10	2	11	39	1,476	12	76	.31	-1.5	.17	7	12.5	nw.	36	nw.	1	4	
Duluth ¹	1,133	5	47	976.6	1,020.7	+1.7	9.2	+1.3	35	23	16	-25	5	3	24	1,728	4	87	.67	-3	.19	13	11.6	nw.	43	nw.	1	5	
North Dakota							12.5	+7.9									85	6.40	-0.2										
Fargo ¹	940	5	43	985.4	1,021.7	+1.0	10.8	+7.0	37	24	18	-22	8	4	29	1,670	8	90	.33	-3	.08	9	10.5	n.	30	nw.	2	4	
Bismarck ¹	1,677	5	43	957.3	1,021.0	+7	14.7	-8.4	40	11	22	-19	31	7	30	1,556	12	87	.39	-1	.17	11	9.7	nw.	43	nw.	13	4	
Devils Lake	1,478	11	44	964.4	1,021.3	+1.3	9.4	+7.6	37	24	16	-24	8	3	26	1,725	5	82	.39	-1	.17	10	7.9	nw.	24	nw.	2	5	
Grand Forks ¹	832	4	41	989.5	1,022.0	-7.8	-	-	44	23	16	-26	8	0	26	1,780	6	-	.74	-	.25	10	-	w.	-	-	3	7	
Williston	1,878	42	50	949.9	1,022.0	+4	15.0	+8.6	42	24	24	-23	31	6	36	1,549	11	82	.47	-1	.17	8	6.5	w.	29	w.	12	8	
Upper Mississippi							19.6	-1.5									84	6.84	-0.8										
Minneapolis-St. Paul ¹	919	43	74	985.4	1,021.3	+1.7	12.7	0	36	18	20	-15	9	5	30	1,621	8	83	.63	-2	.23	8	9.4	nw.	29	nw.	2	8	
Springfield, Minn.	1,625	4	42	983.1	1,021.3	+1.7	11.8	-2.5	37	23	22	-15	9	2	38	1,649	8	84	.85	-2	.35	8	7.5	e.	34	s.	11	6	
La Crosse ¹	714	5	29	993.6	1,021.3	+1.7	14.7	-2.0	36	23	21	-13	9	8	32	1,561	9	78	.59	-8	.34	7	7.9	w.	22	s.	11	3	
Madison ¹	974	70	78	983.4	1,021.0	+1.7	14.7	-1.0	36	23	23	-13	9	6	33	1,560	14	85	.44	-1	.03	8	8.8	w.	30	nw.	1	4	
Charles City	1,015	10	51	983.4	1,022.4	+1.7	14.7	-1.0	36	23	23	-13	9	6	33	1,560	14	85	.44	-1	.03	8	8.8	w.	30	nw.	1	4	
Davenport	606	6	50	988.8	1,022.0	+1.3	21.3	+1.2	43	18	28	-5	4	14	32	1,357	16	85	.67	-4	.26	7	8.6	n.	29	n.	8	5	
Des Moines ¹	860	5	99	994.9	1,022.0	+2.0	17.2	-1.9	40	23	25	-12	2	9	38	1,479	13	82	.60	-7	.18	9	5.4	nw.	20	nw.	1	3	
Dubuque	699	60	79	994.9	1,022.0	+2.0	17.2	-1.9	40	23	25	-12	2	9	38	1,479	13	82	.60	-7	.18	9	5.4	nw.	20	nw.	1	3	
Burlington ¹	702	4	36	994.9	1,022.0	+1.3	18.4	-3.7	40	11	27	-11	0	10	34	1,445	15	86	.77	-9	.40	9	9.6	nw.	35	w.	1	4	
Calro	357	5	99	1,007.8	1,021.0	-0.33	7.1	-1.2	56	25	40	12	9	27	24	971	2	13	-	-	-	14	8.2</						

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments			Pressure		Temperature of the air										Precipitation		Wind			Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms									
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal		Temperature from normal				Mean maximum	Mean minimum	Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Total	Departure from normal						Greatest in 24 hours	Days with 0.01 inch or more	Average hourly velocity	Prevailing direction	Maximum velocity				
						Mean	Maximum	Mean	Minimum	Maximum	Date								Mean	Minimum									Maximum	Miles per hour	Direction	Date	
Northern Slope	ft.	ft.	ft.	Mbs.	Mbs.	Mbs.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.	Ml.												
							35.8	+6.0									78	0.60	-0.1														
Billings ¹	3,570	16	40	892.0	1,019.6	27.3	+4.0	52	13	36	-1	1	19	38	1,160	22	75	.26	10	6	12.3	sw.	80	nw.	13	1	15	15	7.2	4.9	.4	0
Havre	2,507	11	67	928.2	1,021.3	+2.0	18.3	+5.4	47	12	28	-16	31	8	36	1,445	14	84	.82	11	7.9	w.	29	sw.	12	3	9	19	7.5	11.4	1.2	0	
Helena ¹	4,124	6	43	875.0	1,022.4	+1.4	26.5	+7.8	55	13	36	-3	20	17	27	1,194	20	74	.08	3	6.9	w.	43	w.	7	2	8	21	7.7	3.2	1.2	0	
Missoula ¹	3,205	4	32	905.5	1,023.4	.....	27.4	+8.8	50	13	34	6	28	20	22	1,165	24	88	.31	12	9.4	se.	30	w.	13	2	6	23	8.4	2.2	T	0
Kalispell	2,973	48	56	915.0	1,021.3	+1.3	26.2	+8.8	50	12	34	9	29	24	18	1,109	24	78	1.19	13	4.4	nw.	26	w.	13	3	1	27	8.6	4.3	1	0	
Miles City ¹	2,371	5	78	933.3	1,020.7	+7.19	19.3		45	13	31	-21	1	8	42	1,414	16	86	.43	9	12.6	w.	61	nw.	14	9	22	7.5	4.9	1.2	0		
Rapid City ¹	3,259	5	63	902.1	1,020.3	+1.0	26.5	+6.5	53	12	36	-13	1	17	41	1,194	20	80	.53	9	12.6	nw.	61	nw.	14	9	12	10	5.8	4.9	.9	0	
Cheyenne ¹	6,094	5	40	811.4	1,019.6	+2.0	28.4	+2.9	57	10	40	-10	28	17	40	1,134	18	66	.97	8	12.6	nw.	44	nw.	7	6	14	11	6.0	10.2	2.4	0	
Lander	5,352	60	68	835.1	1,022.4	+2.4	20.2	+1.9	55	7	33	-10	30	8	41	1,386	13	72	.37	4	3.4	sw.	30	w.	7	10	15	6	5.0	5.3	10.2	0	
Sheridan ¹	3,790	5	38	884.9	1,021.0	.....	25.0	+5.7	54	13	38	-12	30	12	34	1,244	18	78	.44	6	6.5	nw.	41	nw.	13	8	10	13	6.3	5.4	3.9	0
North Platte ²	2,821	11	51	918.1	1,020.3	+3.3	29.7	+6.8	58	9	40	-3	1	19	40	1,090	22	78	.41	4	6.8	w.	32	n.	14	5	10	16	6.9	5.4	T	0	
Middle Slope							34.3	+3.3									73	0.94	+0.2														
Denver ²	5,292	106	113	837.1	1,018.6	+1.0	33.8	+4.0	63	10	44	6	28	24	33	968	20	64	.69	8	7.3	s.	25	nw.	14	11	10	10	5.9	9.1	.8	0	
Pueblo ¹	4,690	5	36	857.1	1,020.0	+2.4	30.2	+1.5	66	9	47	-5	30	14	55	1,079	16	60	.88	5	6.7	nw.	32	nw.	14	8	6	17	6.1	9.1	2.7	0	
Concordia	1,392	50	58	969.9	1,021.7	+1.0	32.0	+5.6	57	13	40	4	1	24	31	1,025	25	79	.60	9	7.1	w.	33	nw.	14	9	9	13	6.0	4.5	.0	0	
Dodge City ¹	2,509	5	58	929.9	1,020.3	+7.32	4.3	+3.4	63	12	43	5	30	21	42	1,013	23	76	1.48	5	13.7	nw.	50	n.	14	13	4	14	5.6	10.1	6	0	
Wichita ¹	1,358	6	64	970.9	1,021.0	+7.34	1.1	+2.8	60	13	42	10	1	26	30	956	27	78	1.07	8	12.2	nw.	45	nw.	8	8	11	12	6.2	1.6	T	0	
Oklahoma City ¹	1,214	10	47	976.0	1,020.3	+7.39	5.1	+1.7	71	13	48	19	9	31	33	790	30	76	1.21	9	8.3	s.	26	n.	8	8	5	18	6.7	1.6	.0	0	
Tulsa ¹	674	10	60	995.9	1,021.0	.....	38.1	+2.8	70	13	47	14	9	29	39	835	30	78	.64	6	9.1	n.	33	n.	8	3	14	6.9	1.1	.0	0	
Southern Slope							45.0	+3.0									66	0.63	0.0														
Abilene ¹	1,738	4	59	957.3	1,019.3	+3.45	2.1	+2.1	73	14	57	21	29	34	38	613	34	74	.59	3	12.2	se.	37	s.	11	11	12	8	4.8	.0	.0	0	
Amarillo ¹	3,676	5	42	890.6	1,019.6	+1.6	37.8	+4.7	68	11	50	14	30	26	43	843	26	69	.77	3	12.3	sw.	40	sw.	24	14	8	9	4.6	3.1	.0	0	
Del Rio	960	63	71	984.8	1,019.0	+1.0	54.0	+1.7	78	8	63	30	1	44	39	343	41	68	1.14	6	8.1	se.	24	w.	18	9	8	14	6.0	.0	.0	2	
Roswell	3,566	75	85	894.7	1,018.3	+1.0	42.8	+3.6	70	14	57	20	30	28	44	689	25	54	.03	3	6.4	s.	35	sw.	20	16	10	5	4.0	T	.0	0	
Southern Plateau							44.9	+1.6									60	0.72	-0.2														
El Paso ¹	3,778	39	85	887.9	1,017.3	+1.0	45.8	+2.2	67	12	58	24	1	33	37	594	27	49	.11	1	8.4	n.	36	sw.	20	14	13	4	4.0	T	.0	0	
Albuquerque ¹	5,314	5	45	838.8	1,018.6	+3.6	2.7	+5.8	14	47	16	30	26	33	875	24	63	.34	5	8.9	n.	33	e.	6	13	6	12	5.4	1.0	.0	1		
Flagstaff	6,907	36	51	790.4	1,021.3	+3.7	29.3	+1.9	56	10	44	-4	24	15	32	1,110	18	68	.94	8	5.9	nw.	23	e.	12	8	11	6	6.8	11.5	4.0	0	
Phoenix ¹	1,107	39	87	978.0	1,017.6	+7.51	9.1	+7.8	9	64	32	24	40	36	405	38	67	.99	4	5.4	e.	23	w.	20	12	7	12	5.3	.0	.0	2		
Tucson ¹	2,555	5	39	927.5	1,016.6	+7.50	7.1	+1.6	74	9	64	30	24	38	37	448	36	61	.88	5	5.9	se.	18	w.	9	10	12	5.8	.0	.0	.0	0	
Yuma	142	9	54	1,012.6	1,017.3	-3.55	1.1	+7.7	79	14	67	36	24	43	35	305	36	52	.37	4	5.1	n.	18	w.	20	15	10	6	4.2	.0	.0	0	
Middle Plateau							31.4	+3.4									74	0.52	-0.4														
Reno ¹	4,827	20	52	865.9	1,022.7	+2.4	33.2	+2.3	62	13	47	7	24	19	44	989	26	74	.25	5	4.5	sw.	34	s.	15	9	8	14	5.8	1.0	.0	0	
Tonopah	6,090	9	20	815.4	1,020.0	+3.0	2.4	+5.4	9	41	9	22	25	23	992	25	72	.03	2	5.9	w.	26	sw.	18	4	11	16	6.8	11.5	4.0	0		
Winnemucca	4,339	5	56	872.0	1,024.0	+2.7	28.8	+2.9	55	9	41	-7	25	17	44	1,123	24	82	1.27	12	5.9	sw.	26	nw.	15	16	5	10	4.5	15.1	1.7	0	
Modena	5,473	10	46	834.7	1,020.0	+7.29	6.1	+2.9	55	9	42	3	28	17	39	1,105	24	86	.92	3	7.4	w.	25	w.	15	13	5	13	5.5	5.3	.0	0	
Salt Lake City ¹	4,227	32	58	870.6	1,022.7	+1.7	32.1	+4.6	59	14	42	9	22	22	29	1,022	25	76	.39	6	6.9	se.	25	w.	15	13	5	13	5.5	5.3	.0	0	
Grand Junction	4,602	60	68	862.2	1,020.0	+2.0	32.0	+8.0	53	14	43	11	2	21	34	1,024	22	67	.26	5	4.4	se.	14	se.	23	10	5	16	6.3	2.6	.0	0	
Northern Plateau							32.2	+5.1									87	1.08	-0.6														
Baker ²	3,471	36	54	900.1	1,024.7	+3.4	28.2	+3.3	52	7	35	6	22	21	26	1,141	24	90	.92	12	4.5	se.	19	sw.	15	1	7	23	8.4	6.8	1.5	0	
Boise ¹	2,739	5	49	925.8	1,024.7	+2.3	323.2																										

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments			Pressure		Temperature of the air										Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation				Wind				Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms		
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal	Mean	Departure from normal	Maximum	Date	Mean	Minimum	Date	Mean	Minimum				Greatest daily range	Total	Departure from normal	Greatest in 24 hours	Days with 0.01 inch or more	Average hourly velocity	Prevailing direction	Maximum velocity									
																										Miles per hour								Direction	Date
Alaska	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Mbs.</i>	<i>Mbs.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>Mi.</i>	<i>ne.</i>	<i>33</i>	<i>se.</i>	<i>28</i>	<i>2</i>	<i>7</i>	<i>22</i>	<i>0-10</i>	<i>In.</i>	<i>In.</i>	<i>°</i>			
Anchorage ¹	132	6	44	997.0	22.6	+2.0	48	27	30	8	17	15	1.316	19	82	.36	—	5	.11	6	5.6	ne.	33	se.	28	2	7	22	2.5	3	0				
Fairbanks ¹	455	5	63	1,007.5	0.0	+10.	942	28	9	3	26	9	2,018	2	88	.07	—	8	.04	2	4.8	n.	23	e.	28	8	6	17	2.1	6.4	0				
Juneau ¹	80	6	32	1,011.2	32.1	—	44	23	36	12	18	28	1,021	29	86	3.49	—	55	19	7.8	n.	36	se.	12	4	2	25	0.8	0	0					
Nome	22	25	56	1,000.7	17.6	+14.	240	30	23	—	614	12	1,466	12	77	.70	—	4	.23	19	13.4	ne.	40	ne.	21	4	1	26	4.8	9.8	0				
Hawaii																																			
Honolulu	38	86	100																																

¹ Data are airport records.
² Barometric data (adjusted to old city elevation) and hygrometric data from airport; otherwise city office records.
³ Observations taken bihourly.

⁴ Pressure (adjusted to old city elevation), temperature, and hygrometric data from airport; otherwise city office records.
⁵ Temperature and precipitation from city records, other data from airport.

NOTE.—Except as indicated by notes 1, 2, 4, and 5 data in table are city office records.

SEVERE LOCAL STORMS, DECEMBER 1944 (Late Reports)

[Compiled by Mary O. Souder]

[The table herewith contains such data as has been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the United States Meteorological Yearbook]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Buchanan, Andrew, Holt, Nordaway, Worth, Gentry and De Kalb Counties, Mo.	1944 Dec. 3-5				\$87,000	Glaze	Loss to the Southwestern Bell Telephone Company estimated at between \$87,000 to \$90,000 which included damage to parts of Kansas and Iowa. Traffic was greatly hampered by the heavy coating of ice on all surfaces which remained on overhead objects until the 7th with the ground still snow and ice-covered at that time.
Winchester, McLouth, Nortonville and Doniphan Counties, Kans.	4					Freezing rain and glaze.	Telephone and power lines coated with ice from 1 inch to an inch and one-half in diameter. Poles snapped off in some cases, cross-arms failed in others. In Doniphan County severe damage was reported to apple trees because of broken branches, especially in the vicinity of Troy with the estimated apple crop materially less for this year.
New York, N. Y.	8					Wind and rain	Rain, driven by a forty-mile-an-hour wind, with gusts up to 60 miles an hour caused damage to cornices, signs, and copings. 75 flights at La Guardia Field canceled.
Missouri, northern two-thirds of State.	9-11					Heavy snow	On 9-10 heavy snow ranging in depth from 4 to more than 9 inches over the northern two-thirds of the State. The snow was badly drifted by high winds on the 10-11, blocking many roads and generally impeding highway and rail traffic. Several schools were forced to close as buses could not get through the deep drifts.
Ohio	11-12					Snow	The storm produced a general snow cover of from about 4 to 14 inches, except lesser amounts to the west and southwest of Dayton. Wet sticky snow over extensive areas damaged numerous trees and shrubbery in and near Marietta. During this storm or soon afterward, the snow became badly drifted and highway traffic was obstructed worse than it had been for years. Many schools were closed from the 12th to the 16th when it was impossible to get the county roads open to traffic.
Pittsburgh, Pa., and vicinity.	11-12				2,000,000	do	The greatest 24-hour snowfall was recorded during this storm for the month at western and many northern stations. According to a survey conducted by the Federal-State Flood Forecasting Service at Pittsburgh, snowfall averaged 16 inches over the Allegheny Basin, 18 inches over the Monongahela, and 12 inches over the Upper Ohio. Small communities were isolated and many secondary roads blocked by drifted snow.
West Virginia	11-12				250,000	Rain and snow	Precipitation started with rain in most places followed by very wet snow, which, as the temperature dropped on the 12th, became dry and light. This snowfall, at the wet, freezing stage, overloaded telephone and telegraph wires to such an extent that sections broke and whole communities were isolated. Parkersburg was unable to get word news for about 18 hours. Radio station WPAR, with all lines dead, signed off almost 2 hours early. Teletypes at the Parkersburg News, Western Union, and the U. S. Weather Bureau were out of order for several hours during the night. People living in outlying sections of cities, in villages, and on farms, found themselves marooned by the drifts. Trains hours late and bus schedules were canceled. All city and country schools closed in the heavy snow areas. Loss to the Potomac Telephone Company approximately \$250,000. Rural power lines considerably damaged. Highway traffic greatly hindered and many accidents caused by icy pavements. Damage to forest trees, especially the evergreens, was considerable.
Crown Point, Oreg., and vicinity.	12				9,200	Wind	A room torn from a dwelling, barn destroyed, and 4 calves killed; 3 houses burned.
Canton, Miss.	25	p. m.				Wind and hail	Some damage to garages and roofs.
Eureka, Emporia and Topeka to Atchison, Kans.	26-27					Freezing rain	Highways ice-covered from the Oklahoma line through Eureka, Emporia and Topeka to Atchison. In Chanute and vicinity, a little south and to the east of Eureka the storm was most severe with travel for some time almost impossible.
Kentucky	27-29					Freezing rain and sleet.	Roads icy and slippery throughout practically the entire section. Automobile and railway traffic delayed or suspended, but damage limited to minor traffic mishaps with no fatal or serious injuries reported.
Virginia, entire State	27-29			1		Glaze and sleet	Glaze and sleet ranging up to more than an inch on the 27th and again on the 29th, caused extremely hazardous highway conditions throughout Virginia. A truck skidding on the ice crushed a man to death at Fishersville. In Richmond, collisions caused by icy streets were the source of minor, but painful injuries to 12 persons.
Houston, Tex.	31	11:35 a. m.			1,500	Straight-line wind	Property damaged.

SOLAR RADIATION AND SUNSPOT DATA FOR JANUARY 1945

(Solar Radiation Investigations Section, I. F. HAND, in charge)

SOLAR RADIATION OBSERVATIONS

EXPLANATIONS of the tables and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the January 1944 Review, page 43. A list of the pyrheliometric stations also is given on page 45 of the same Review.

Beginning with this issue, values of total solar and sky radiation received on a horizontal surface at Portland, Maine, will be included in Table 2. The instrumental equipment at the Portland Weather Bureau Airport Station consists of an Eppley 10-junction pyrheliometer recording on a Leeds and Northrup micromax potentiometer. The coordinates of the station are as follows: Latitude 43°39' North, Longitude 70°18' West, and Elevation (pyrheliometer) 74 feet.

TABLE 1.—Solar radiation intensities during January 1945

(Gram-calories per minute per square centimeter of normal surface)

MADISON, WIS.

Date	Sun's zenith distance										75th mer. time
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	Air mass										
	A. M.					*1.0	P. M.				
	e	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e
Jan. 2.....	mb.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mb.
Jan. 3.....	0.7	0.86	0.96	1.18	1.54	1.54	1.14	cal.	cal.	cal.	0.6
Jan. 4.....	1.7	.92	1.01	1.11	1.56	1.56	1.07	1.07	1.07	1.07	1.5
Jan. 5.....	0.8	.98	.87	1.08	1.36	1.36	1.06	1.06	1.06	1.06	1.2
Jan. 6.....	0.3	.84	.98	1.11	1.56	1.56	1.06	1.06	1.06	1.06	0.6
Jan. 7.....	2.9	.96	1.06	1.19	1.56	1.56	1.06	1.06	1.06	1.06	3.0
Jan. 8.....	0.9	.74	.88	.99	1.36	1.36	1.06	1.06	1.06	1.06	1.1
Jan. 9.....	0.6	.83	1.02	1.18	1.60	1.60	1.06	1.06	1.06	1.06	1.3
Means.....	.88	.97	1.12	1.52	(1.14)	(1.14)	1.06	1.06	1.06	1.06	
Departures.....	-.04	-.06	-.07	-.03	.00	.00					

LINCOLN, NEBR.

Jan. 1.....	1.1	1.02	1.18	1.29							1.4
Jan. 4.....	2.3			1.13							4.4
Jan. 10.....	4.0	.87	.96								5.1
Jan. 13.....	6.1			1.29							5.3
Jan. 22.....	2.9			.87							4.8
Jan. 24.....	4.6						1.16	0.96	0.88		5.6
Jan. 25.....	15.3		.94	1.08			1.29	1.20	1.18		6.4
Means.....	.94	1.03	1.13				(1.22)	(1.08)	(1.03)		
Departures.....	+.02	-.02	-.07				+.03	+.03	+.09		

ALBUQUERQUE, N. MEX.

Jan. 5.....	2.3	1.11	1.21	1.31	1.41	1.48	1.42	1.34	1.28	2.9
Jan. 7.....	2.7				1.39					2.9
Jan. 8.....	3.3			1.28	1.43	1.46	1.41	1.37	1.34	4.0
Jan. 9.....	3.2	1.00	1.12	1.25	1.41	1.46	1.42	1.38	1.32	4.0
Jan. 12.....	4.2	.88	1.02	1.17	1.35	1.40	1.35	1.31		4.0

TABLE 1.—Solar radiation intensities during January 1945—Con.

(Gram-calories per minute per square centimeter of normal surface)

ALBUQUERQUE, N. MEX.—Continued

Date	Sun's zenith distance										75th mer. time
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	Air mass										
	A. M.					*1.0	P. M.				
	e	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e
Jan. 13.....	mb.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mb.
Jan. 14.....	3.6	.94	1.07	1.21	1.40	1.40	1.45	1.40	1.39	1.27	4.2
Jan. 21.....	3.8		1.20	1.31	1.40	1.40	1.36	1.31	1.27	1.05	4.2
Jan. 22.....	2.4		1.21	1.30			1.27	1.27	1.16	1.11	2.0
Jan. 24.....	2.6						1.42	1.27	1.16	1.11	3.2
Jan. 25.....	3.4			1.24	1.40		1.44	1.41	1.34	1.29	3.2
Jan. 26.....	2.4	.79	.98	1.11			1.44	1.41	1.34	1.29	3.2
Jan. 28.....	3.0		.93	1.02	1.30						3.3
Jan. 29.....	2.5	1.00	1.07	1.17	1.32			1.44	1.40		3.0
Jan. 30.....	1.9	1.08	1.17	1.29	1.44		1.51	1.46	1.34		2.4
Jan. 31.....	2.4	1.03	1.12	1.21							2.0
Means.....	.98	1.10	1.22	1.38			1.44	1.38	1.33	1.24	
Departures.....	-.05	-.03	-.03	-.02			-.02	+.10	+.13	+.12	

BLUE HILL, MASS.

Jan. 2.....	2.5	0.80	0.94						0.91	0.74	1.9
Jan. 5.....	1.6	1.00	1.08						1.29	1.16	1.4
Jan. 6.....	1.0								1.29	1.16	0.7
Jan. 10.....	0.9	1.11	1.19						1.29	1.16	0.9
Jan. 18.....	1.6	1.05	1.16	1.50	1.46				1.26	1.15	2.2
Jan. 19.....	1.4		1.07	1.24	1.43				1.28	1.17	1.1
Jan. 20.....	0.9	1.05	1.14	1.24	1.40				1.28	1.17	2.4
Jan. 22.....	2.6	.82	.94	1.05							3.5
Jan. 24.....	2.2	.93	1.06	1.14							2.5
Jan. 25.....	0.5	.92	1.05	1.20	1.39			1.20	1.09	.99	1.1
Jan. 26.....	0.7	1.09	1.20	1.29	1.47			1.31	1.20	1.10	0.6
Jan. 27.....	1.3							1.38			2.4
Jan. 28.....	1.6	1.06	1.16					1.38	1.06	.98	2.4
Jan. 30.....	2.0	.92	1.07	1.18							2.4
Means.....	.96	1.09	1.19	1.43			(1.38)	1.26	1.11	1.00	
Departures.....	+.04	+.03	+.04	+.11			+.05	+.09	+.07	+.07	

BOSTON, MASS.

Jan. 2.....	3.3	0.64	0.71	0.91				0.93	0.77	0.56	3.1
Jan. 5.....	1.7	.71	.67	.71				1.02	.79	.75	1.5
Jan. 6.....	1.3	.93	.44	1.16							0.9
Jan. 10.....	0.7	.82	.86								0.8
Jan. 11.....	1.2							.86			1.4
Jan. 18.....	1.7	.75	.92	1.10	1.05			1.05	1.05	.98	2.1
Jan. 19.....	2.0							1.23	1.13	1.01	2.0
Jan. 20.....	1.4	.91	.76	1.01							2.5
Jan. 22.....	3.0	.58	.64	.65				1.24	1.11	.97	3.5
Jan. 25.....	0.7			1.12	1.24			1.24	1.11	.97	0.9
Jan. 26.....	0.6	.87	.98	1.09	1.35			1.35	1.14	1.13	1.1
Jan. 30.....	2.3	.83	.85	1.00	1.11			1.11	.99	.73	2.9
Jan. 31.....	2.1			1.16				1.16	.91		1.9
Means.....	.78	.75	.97	1.18			1.19	1.02	.91	.78	

Ratio, Boston-Blue Hill on comparable dates

	0.78	0.73	0.83	0.84			0.88	0.88	0.85	
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* Extrapolated.

TABLE 2.—Daily totals and weekly means of solar radiation (direct+diffuse) received on a horizontal surface

(Gram-calories per square centimeter)

Date 1945	Washington, D. C.	Madison, Wis.	Lincoln, Nebr.	East Lansing, Mich.	New York, N. Y.	Fresno, Calif.	Fairbanks, Alaska	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	Twin Falls, Idaho	La Jolla, Calif.	Riverside, Calif.	Blue Hill, Mass.	Portland, Maine	Ithaca, N. Y.	Newport, R. I.	State College, Pa.	Put-in-Bay, Ohio	East Wareham, Mass.	Davis, Calif.	Boulder, Colo.	Tecoma, Utah	Illumination— Boston, Mass.
	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	ft. candles
Jan. 1	22	100	240	64	12	62	3	250	17	56	124	278	304	26	10	54	16	71	238	150	177	220	1,417	
Jan. 2	239	224	154	99	196	125	12	143	157	162	192	270	306	187	232	189	192	244	212	75	228	304	1,417	
Jan. 3	211	221	66	93	116	45	5	198	140	106	203	241	279	179	153	174	159	77	207	40	235	301	1,266	
Jan. 4	181	174	211	101	92	51	4	241	65	90	213	292	301	80	63	48	83	208	54	33	232	330	689	
Jan. 5	221	106	24	86	194	67	8	50	166	254	122	267	255	205	169	206	102	89	230	66	96	195	1,403	
Jan. 6	140	84	59	71	138	93	2	21	175	9	71	250	270	222	200	194	105	71	234	91	160	253	1,406	
Jan. 7	44	75	216	113	25	63	0	24	22	15	113	276	289	31	25	74	83	34	39	188	258	239	949	
Mean	151	149	139	90	110	72	5	132	106	99	148	268	286	133	138	127	104	121	162	83	184	261	949	
Departure	-14	+19	-28	+3	-7	-70	-2	+5	+10	-4	-1	+20	+37	-7	+35	-17	-6	+19	+7	-60	-20	-----	-----	
Jan. 8	22	109	165	34	135	64	4	30	35	44	187	255	283	95	163	61	172	47	52	27	238	292	335	
Jan. 9	134	187	161	178	116	74	4	218	43	86	132	66	281	59	214	66	210	243	54	36	134	270	494	
Jan. 10	192	148	155	79	222	65	5	248	193	255	83	49	56	231	224	223	194	145	255	40	114	227	1,551	
Jan. 11	184	125	195	113	152	73	0	242	135	281	172	184	225	180	149	167	225	196	183	164	212	277	1,051	
Jan. 12	62	75	184	48	62	191	0	205	72	8	132	284	301	68	11	84	32	39	71	251	223	308	726	
Jan. 13	25	54	254	132	44	80	2	206	42	183	90	298	306	33	113	44	50	180	52	134	219	241	425	
Jan. 14	29	30	137	122	26	99	0	23	54	120	178	209	302	41	50	34	50	141	22	42	210	296	538	
Mean	93	104	179	101	108	92	2	168	82	139	139	192	250	101	132	97	133	141	98	99	193	273	737	
Departure	-60	-32	-4	-6	-16	-64	-7	+30	-18	-3	-15	-65	+1	-57	+19	-67	-7	+13	-64	-78	-13	-----	-----	
Jan. 15	23	173	98	60	125	156	0	24	159	2	39	141	243	184	107	167	32	30	198	270	207	154	1,399	
Jan. 16	81	211	32	159	23	194	21	114	46	16	178	257	309	35	43	38	25	76	75	24	291	95	290	462
Jan. 17	268	118	23	201	251	137	12	77	96	105	198	306	317	104	116	156	103	282	289	116	46	101	345	941
Jan. 18	246	96	65	68	258	63	1	119	258	140	86	291	305	257	221	210	247	253	113	276	301	247	140	1,933
Jan. 19	133	63	30	38	193	197	5	92	226	42	172	276	140	252	213	173	227	202	150	269	309	52	228	1,729
Jan. 20	99	82	35	122	225	297	15	139	217	16	220	316	337	258	200	208	235	264	291	215	307	132	176	1,738
Jan. 21	153	163	59	60	149	316	6	16	146	148	160	80	306	211	174	219	129	162	-----	308	283	263	1,239	
Mean	143	129	49	101	175	194	9	83	164	67	150	238	280	186	161	148	174	177	159	183	262	160	224	1,349
Departure	-15	-23	-136	-21	+50	+11	-4	+47	+40	-98	-24	-24	-1	+24	+28	+5	+29	+13	+23	+48	-49	-----	-----	
Jan. 22	24	207	282	30	33	306	13	176	119	30	136	285	234	151	212	38	92	30	100	149	315	241	315	985
Jan. 23	204	239	269	63	203	293	30	309	131	268	198	315	333	147	154	152	192	166	117	199	292	281	336	1,190
Jan. 24	223	279	251	180	162	161	21	238	114	262	148	242	324	163	186	170	111	246	289	138	143	94	208	1,088
Jan. 25	305	149	250	84	267	180	30	233	247	206	252	117	150	275	243	230	262	320	160	301	144	278	371	2,011
Jan. 26	310	142	142	204	263	249	5	72	242	258	145	169	240	203	227	192	271	328	320	318	273	199	191	1,931
Jan. 27	316	111	104	76	258	306	8	53	234	92	49	216	255	283	219	198	250	318	168	298	281	76	330	1,922
Jan. 28	156	182	141	106	168	311	22	280	202	8	109	307	357	256	272	116	259	62	87	271	285	308	402	1,685
Mean	220	187	206	107	193	258	18	187	184	161	157	236	270	224	216	156	207	210	176	239	248	211	310	1,546
Departure	+44	+7	-15	-17	+36	+52	-6	+14	+24	-17	-22	-30	+26	+44	+26	+18	+31	+72	+26	+67	+48	-2	-----	-----

ACCUMULATED DEPARTURES ON JAN. 28, 1945

-315	-203	-1,281	-287	+441	-497	-133	+14	+392	-924	-434	-693	+441	+28	-----	+700	-336	+616	+497	+231	-294	-588	-----	-----
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POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR
JANUARY 1945

By LUCY T. DAY

[Equatorial Division, U. S. Naval Observatory]

[Communicated by Commodore J. F. HELLWEG, U. S. N. (Ret.) Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count are included assumed longitude of center of the disk, assumed latitude of center of the disk, total areas of spots and groups and total spot count.

Date	East- ern stand- ard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate qual- ity	Observatory
			Dif- fer- ence in longi- tude	Longi- tude	Lat- itude	Dis- tance from cen- ter of disk				
1945 Jan. 1	h m		°	°	°	°				
1	11 15	7705 7703	+37 +77	213 253	-29 +25	44 78	36 24	4 1	G	Mt. Wilson.
				(176)	(-3)		60	5		
2	12 30			No spots						Do.†
3	11 15			No spots						Do.†
4	13 36	7706	-78	58	+18	79	36	1	G	U. S. Naval.
				(136)	(-3)		36	1		
5	11 42	7706 7706 7708 7708 7707	-70 -65 -41 -33 +27	53 58 82 90 150	+18 +19 +25 +26 -26	72 69 49 44 36	12 48 6 24 24	1 3 1 2 3	G	Do.
				(123)	(-4)		114	10		
6	11 43	7710 7706 7706 7706 7709	-78 -57 -56 -48 +68	32 53 54 62 178	-24 +18 +19 +19 -35	78 60 60 53 70	145 24 61 36 48	1 1 2 2 3	G	Do.
				(110)	(-4)		314	9		
7	11 6	7710 7706 7711 7709	-64 -44 -33 +79	33 53 64 176	-25 +18 +21 -35	66 49 36 79	121 36 24 24	1 5 7 3	G	Mt. Wilson.
				(97)	(-4)		205	16		
	11 15	7710 7711	-51 -19	33 65	-25 -22	54 25	121 61	1 15	VG	Do.
				(84)	(-4)		182	16		
9	12 26	7712 7710 7711 7711	-42 -37 -7 -4	28 33 63 66	-26 -25 -20 -21	46 42 17 18	12 170 12 24	2 1 2 8	G	U. S. Naval.
				(70)	(-4)		218	13		
10	11 18	7713 7710 7710 7711 7711	-85 -24 -23 -18 -12	333 54 35 40 46	+23 -25 -24 -26 -21	86 31 30 26 21	48 145 36 24 12	1 1 3 1 1	F	Do.
				(58)	(-4)		265	7		
11	10 56	7713 7712 7710 7710	-73 -21 -12 -10	332 24 33 35	+23 -27 -24 -24	75 31 23 23	97 48 97 12	1 6 1 2	F	Do.
				(45)	(-4)		254	10		
12	10 46	7713 7712 7712 7710	-57 -6 -2 +2	335 26 30 34	+22 -27 -25 -25	61 24 22 22	97 48 61 73	1 1 2 2	P	Do.
				(32)	(-4)		279	6		
13	10 44	7713 7712 7712 7712 7710	-43 +8 +12 +13 +15	336 27 31 32 34	+22 -27 -26 -27 -25	50 25 25 27 25	97 36 12 12 73	1 3 2 2 2	F	Mt. Wilson.
				(19)	(-4)		230	10		
14	10 54	7714 7713 7712 7712 7710	-48 -29 +25 +27 +29	317 336 30 32 34	-4 +22 -27 -25 -25	48 39 33 34 35	12 97 12 16 36	2 1 6 5 1	VG	Do.
				(5)	(-4)		173	15		
15	11 39	7714 7713 7712 7710	-35 -16 +37 +41	317 336 29 33	-4 +21 -27 -25	35 30 42 45	16 97 12 12	3 1 3 1	P	Do.
				(352)	(-5)		137	8		

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR
JANUARY 1945—Continued

Date	East- ern stand- ard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate qual- ity	Observatory
			Dif- fer- ence in longi- tude	Longi- tude	Lat- itude	Dis- tance from cen- ter of disk				
1945 Jan. 16	h m		°	°	°	°				
16	10 47	7714 7713 7710	-22 -3 +55	317 336 34	-5 +21 -25	22 26 57	16 73 6	2 1 1	P	Mt. Wilson.
				(339)	(-5)		95	4		
17	10 47	7713 7710	+10 +67	336 33	+22 -24	28 69	97 6	1 1	G	U. S. Naval.
				(326)	(-5)		103	2		
18	11 8	7716 7715 7713	-74 -3 +24	239 317 337	+26 -19 +22	78 15 36	145 48 109	1 1 1	F	Do.
				(313)	(-5)		302	6		
19	13 10	7716 7716 (*) 7713	-68 -55 -53 +39	230 243 245 337	+28 +27 -17 +22	72 62 55 47	6 170 12 97	1 1 3 1	G	Do.
				(298)	(-5)		285	6		
20	10 53	7716 7717 7713	-44 -32 +50	242 254 336	+25 +21 +22	53 40 57	194 16 97	1 2 1	G	Mt. Wilson.
				(286)	(-5)		307	4		
21	13 56	7716 7717 7713	-29 -16 +64	243 256 336	+26 +22 +22	42 30 70	121 73 97	1 1 1	P	U. S. Naval.
				(272)	(-5)		291	3		
22	11 5	7718 7716 7717	-33 -14 +2	227 246 262	+26 +25 +22	45 33 27	24 97 48	1 1 1		†Mt. Wilson.
				(260)	(-5)		169	3		
23	10 32	7718 7716 7717	-21 -3 +11	226 244 258	+27 +25 +23	38 30 30	48 97 36	2 1 1	F	U. S. Naval.
				(247)	(-5)		181	4		
24	10 20	7718 7716 7717	-7 +9 +25	227 243 259	+27 +25 +23	33 31 38	16 73 12	2 1 1	F	Do.
				(234)	(-5)		101	4		
25	10 46	7716	+22	243	+24	38	73	1	F	Do.
				(221)	(-6)		73	1		
26	10 44	7716	+35	243	+24	47	36	2	G	Do.
				(208)	(-6)		36	2		
27	10 30	7719 7719 7716 7716	+19 +21 +45 +47	213 215 239 241	-6 -5 +23 +25	19 21 54 58	73 48 24 48	9 9 1 3	G	Do.
				(194)	(-6)		193	22		
28	10 38	7719 7719 7719 7716	+31 +34 +38 +59	212 215 219 240	-9 -8 -8 +25	31 34 38 66	24 73 109 61	1 1 2 2	F	Do.
				(181)	(-6)		267	14		
29	10 55	7719 7719 7719 7719	+45 +47 +47 +52	213 215 215 220	-10 -10 -7 -8	45 47 47 52	48 158 24 206	2 1 1 2	G	Do.
				(168)	(-6)		436	6		
30	10 42	7719 7719 7719 7719	+60 +60 +65 +68	215 215 220 223	-10 -8 -7 -8	60 60 65 68	145 36 24 291	6 6 1 1	G	Do.
				(155)	(-6)		496	14		
31	11 2	7719 7719	+74 +78	216 220	-11 -9	74 78	6 1	1 1	F	Do.
				(142)	(-6)		297	2		

Mean daily area for 31 days = 197

†Data from Mount Wilson charts.

*Not numbered.

VG = very good; G = good; F = fair; P = poor.

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, January 1945

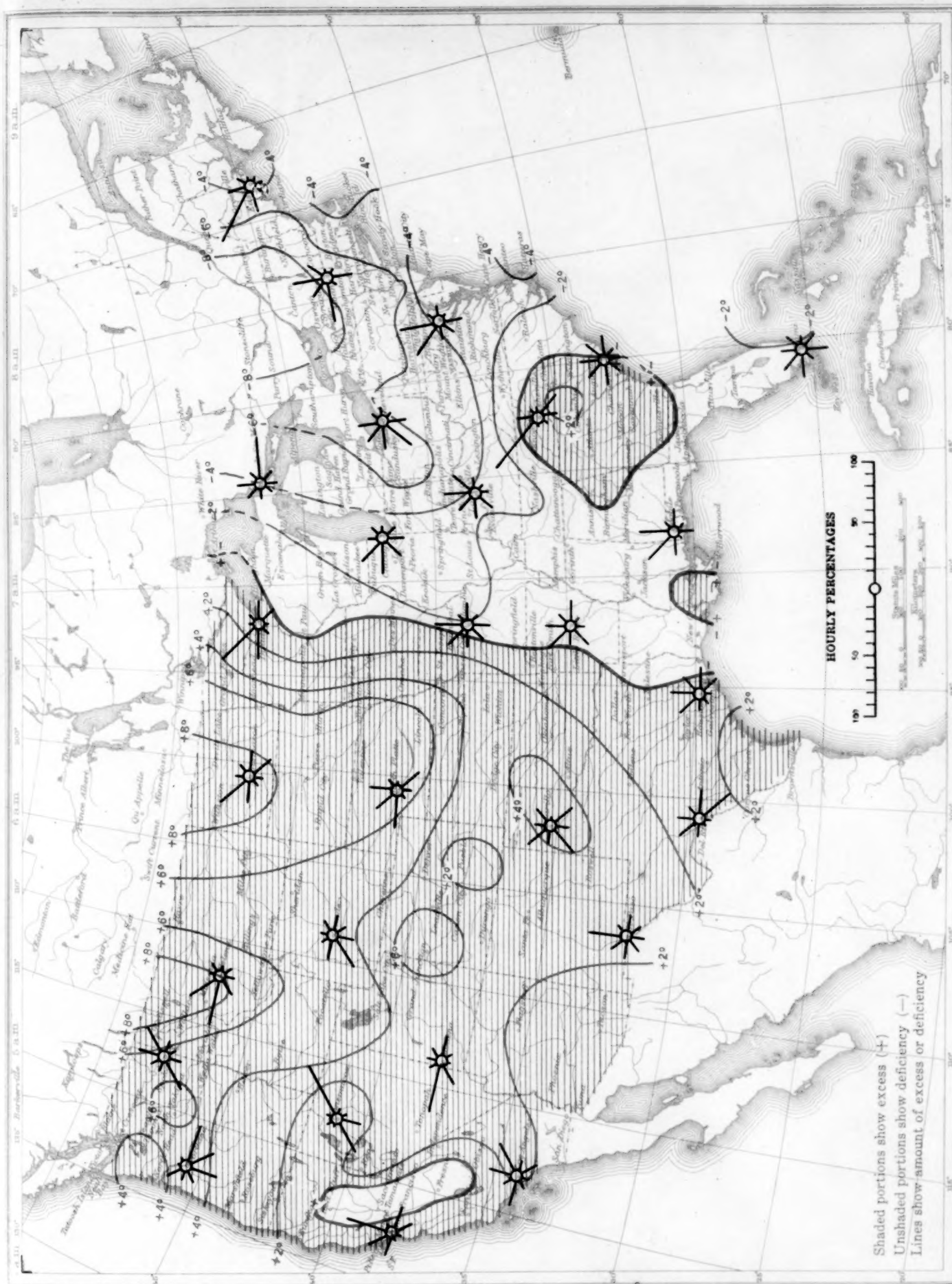


Chart II. Tracks of Centers of Anticyclones, January 1945. (Inset) Departure of Monthly Mean Pressure from Normal
(Plotted by D. R. Harris)

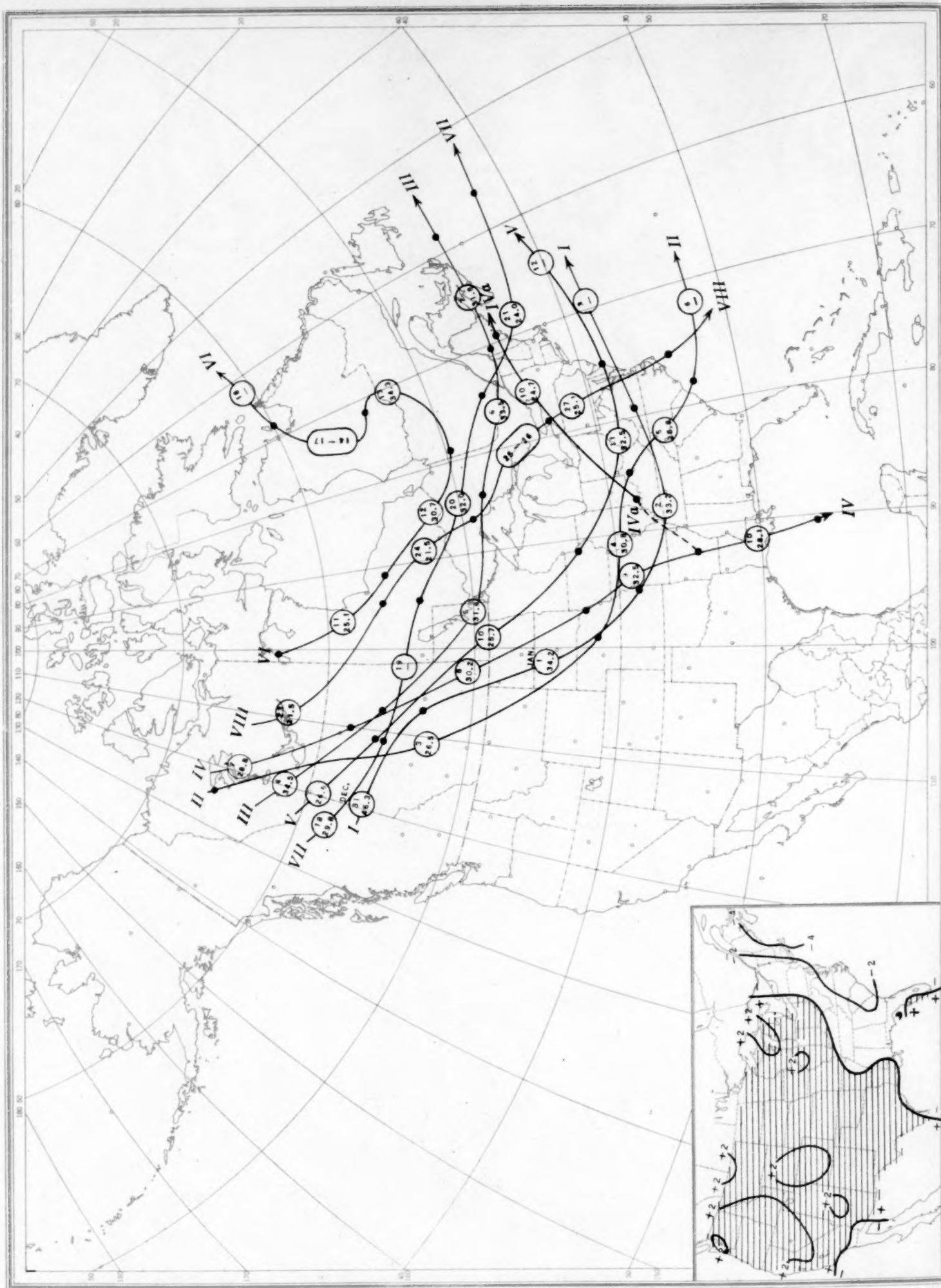
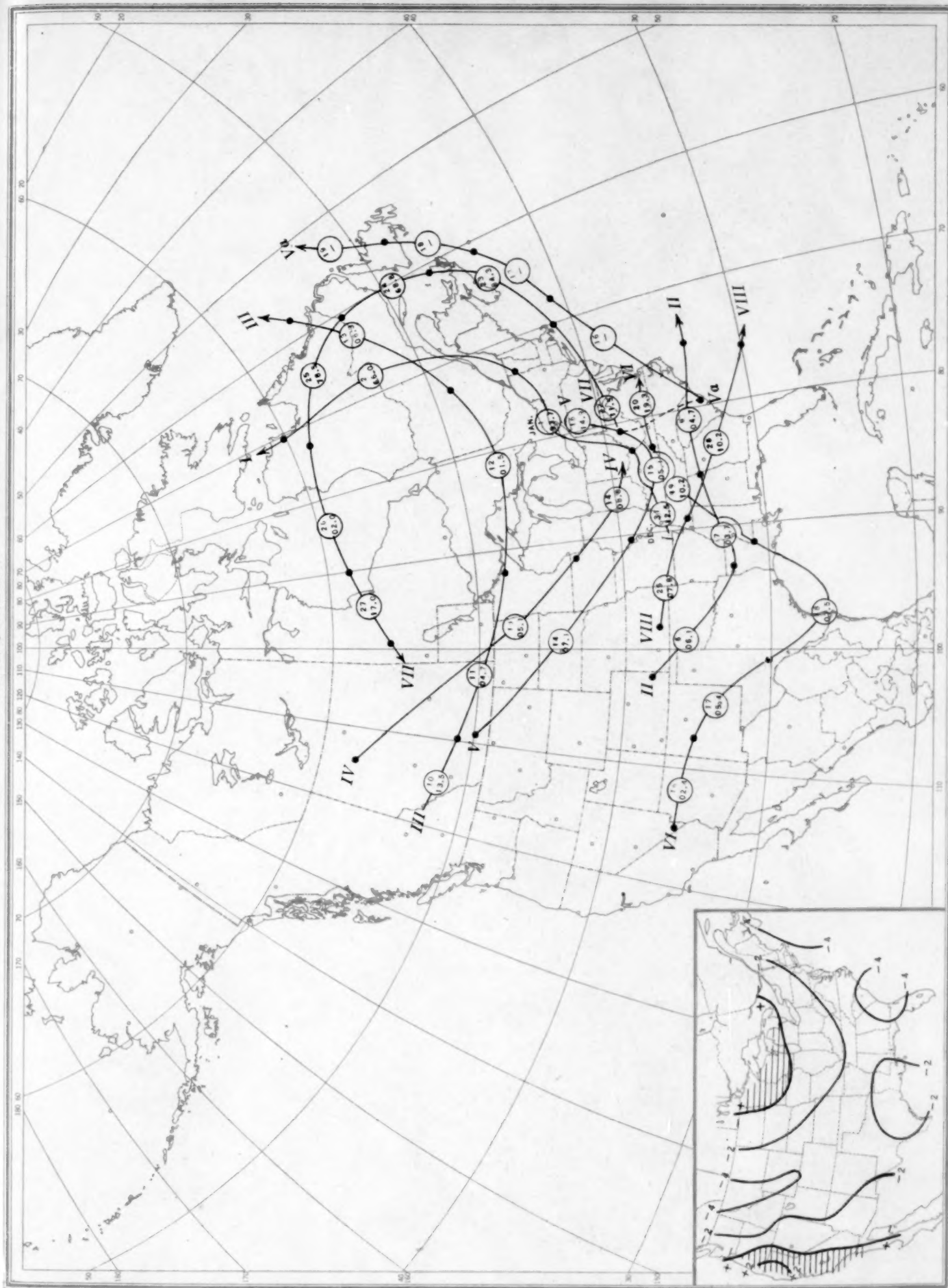


Chart III. Tracks of Centers of Cyclones, January 1945. (Inset) Change in Mean Pressure from Preceding Month

Chart III. Tracks of Centers of Cyclones, January 1945. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by D. R. Harris)



Circle indicates position of cyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 7:30 p. m. (75th meridian time)

Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, January 1945

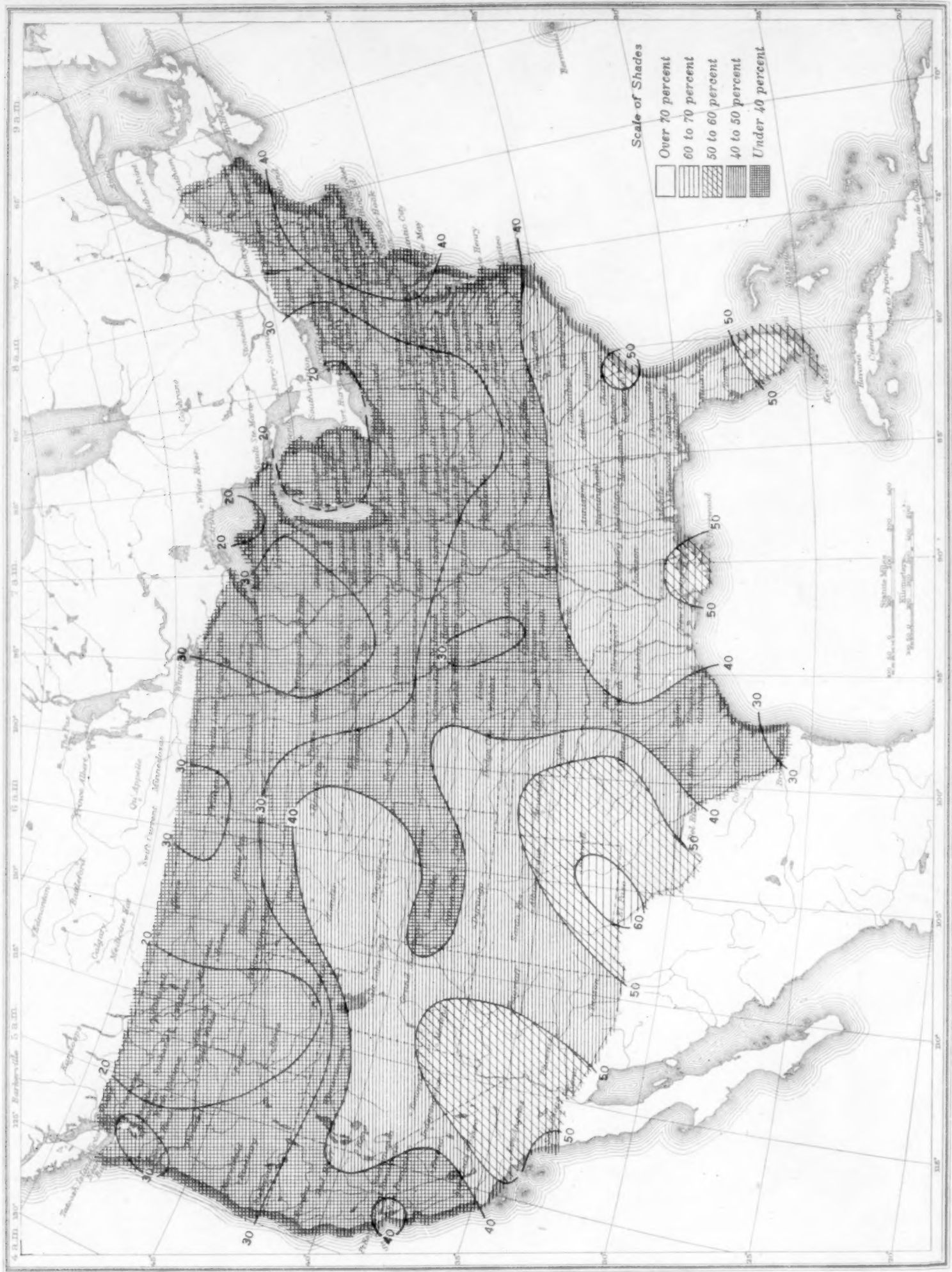


Chart V. Total Precipitation, Inches, January 1945. (Inset) Departure of Precipitation from Normal

Chart V. Total Precipitation, Inches, January 1945. (Inset) Departure of Precipitation from Normal

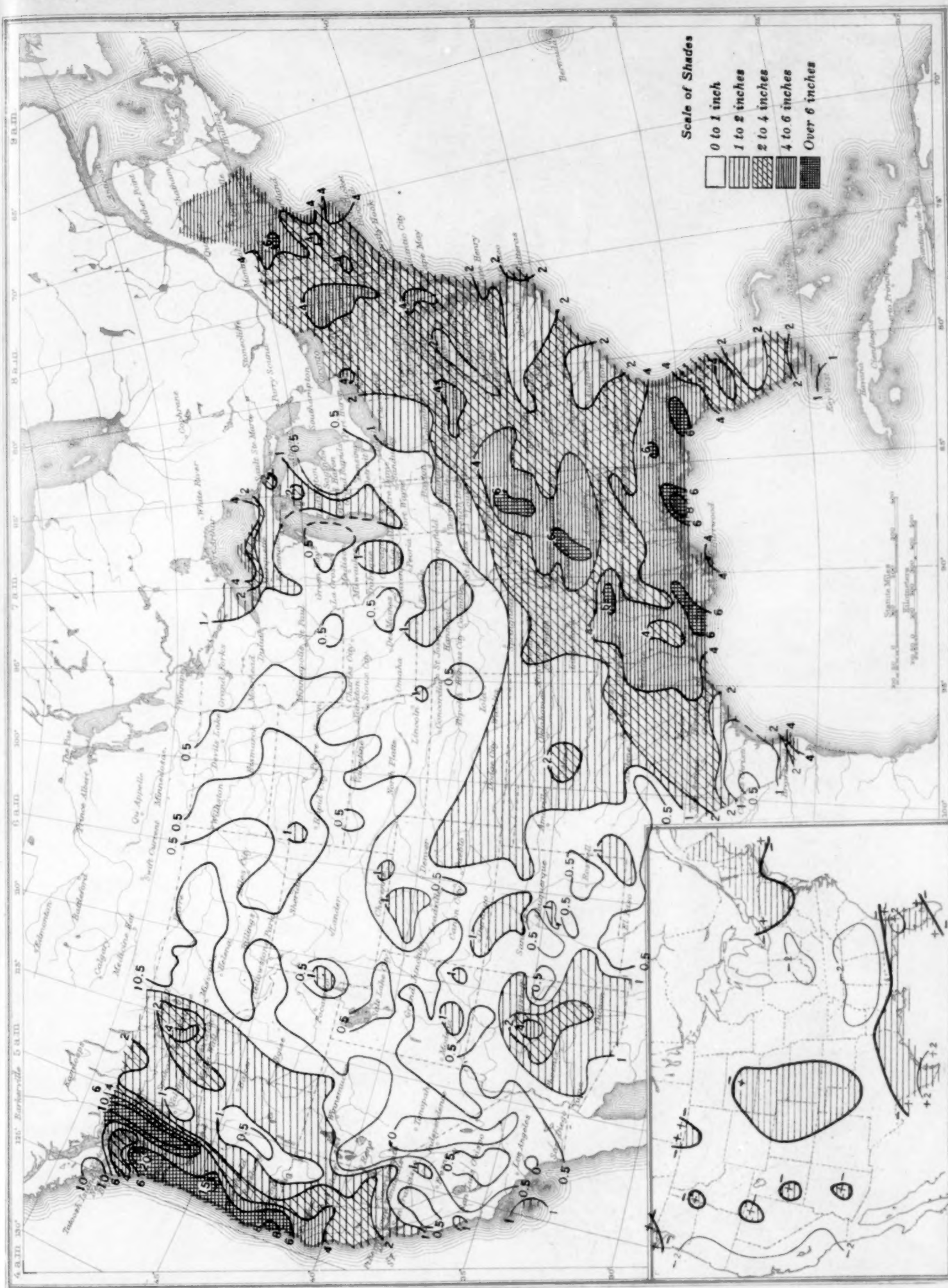


Chart VI. Isobars(mb), at Sea Level and Isotherms °F at Surface; Prevailing Winds, January 1945



Chart VII. Total Snowfall, Inches, January 1945. (Inset) Depth of Snow on the Ground at 7:30 p. m., Monday, January 29, 1945

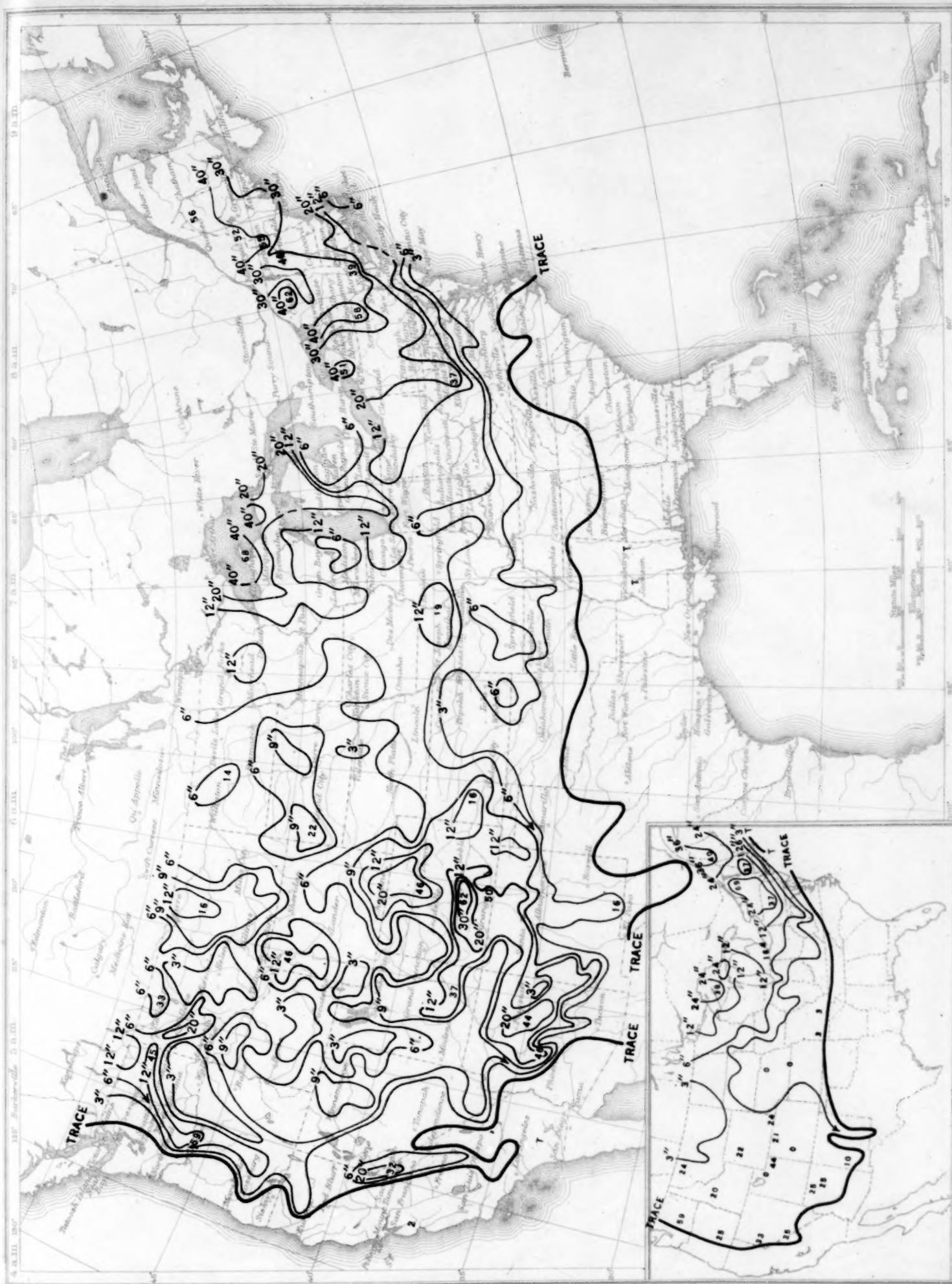


Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.), and Isotherms (°C.), and Resultant Winds for 1,500 Meters (m.s.l.) January 1945
 Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

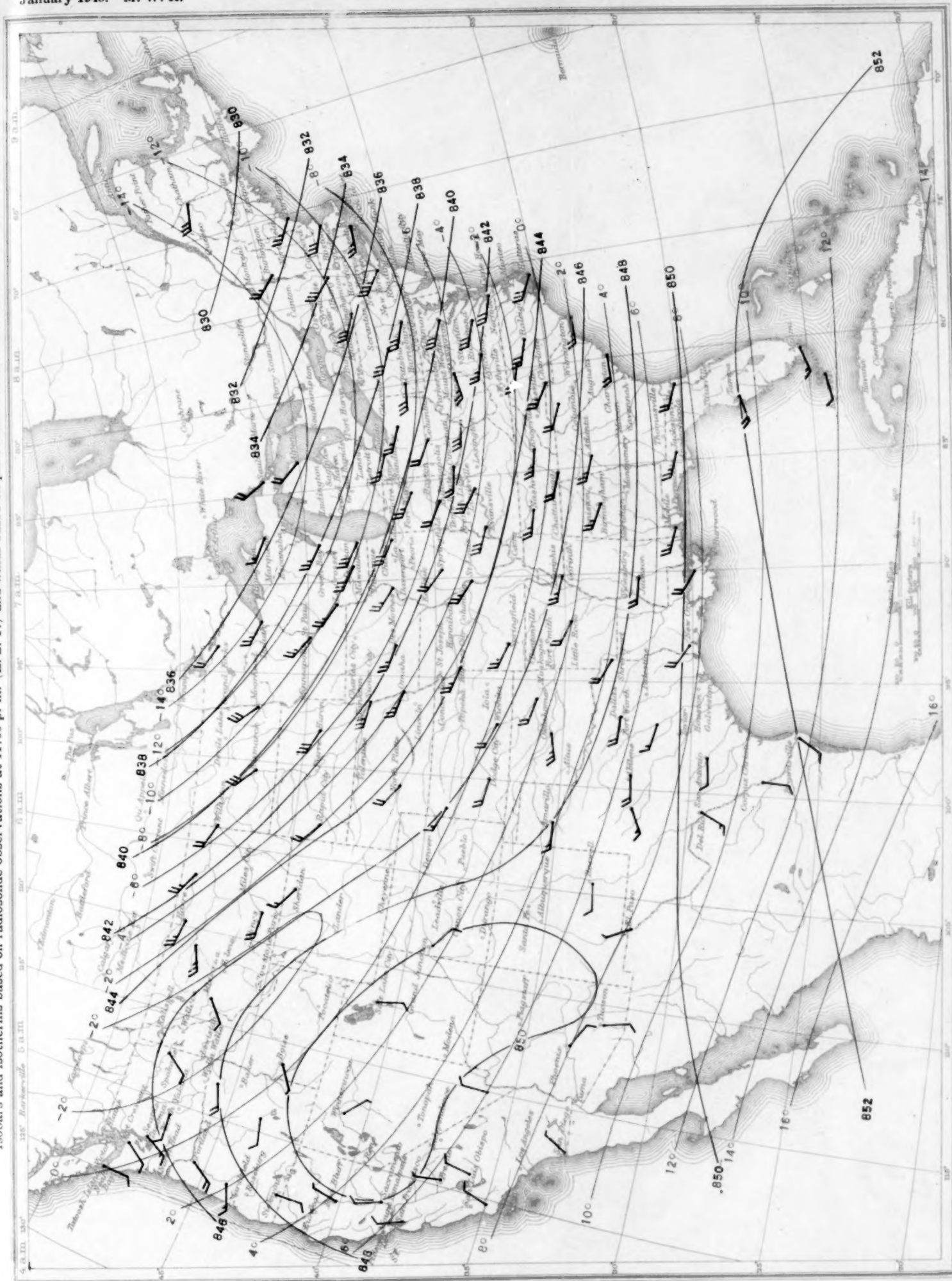


Chart IX. Isobars (mb), Isotherms ($^{\circ}\text{C}$), and Resultant Winds for 3,000 Meters (m. s. l.) January 1945
 Isobars and isotherms based on radiosonde observations 11:00 p. m. at (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

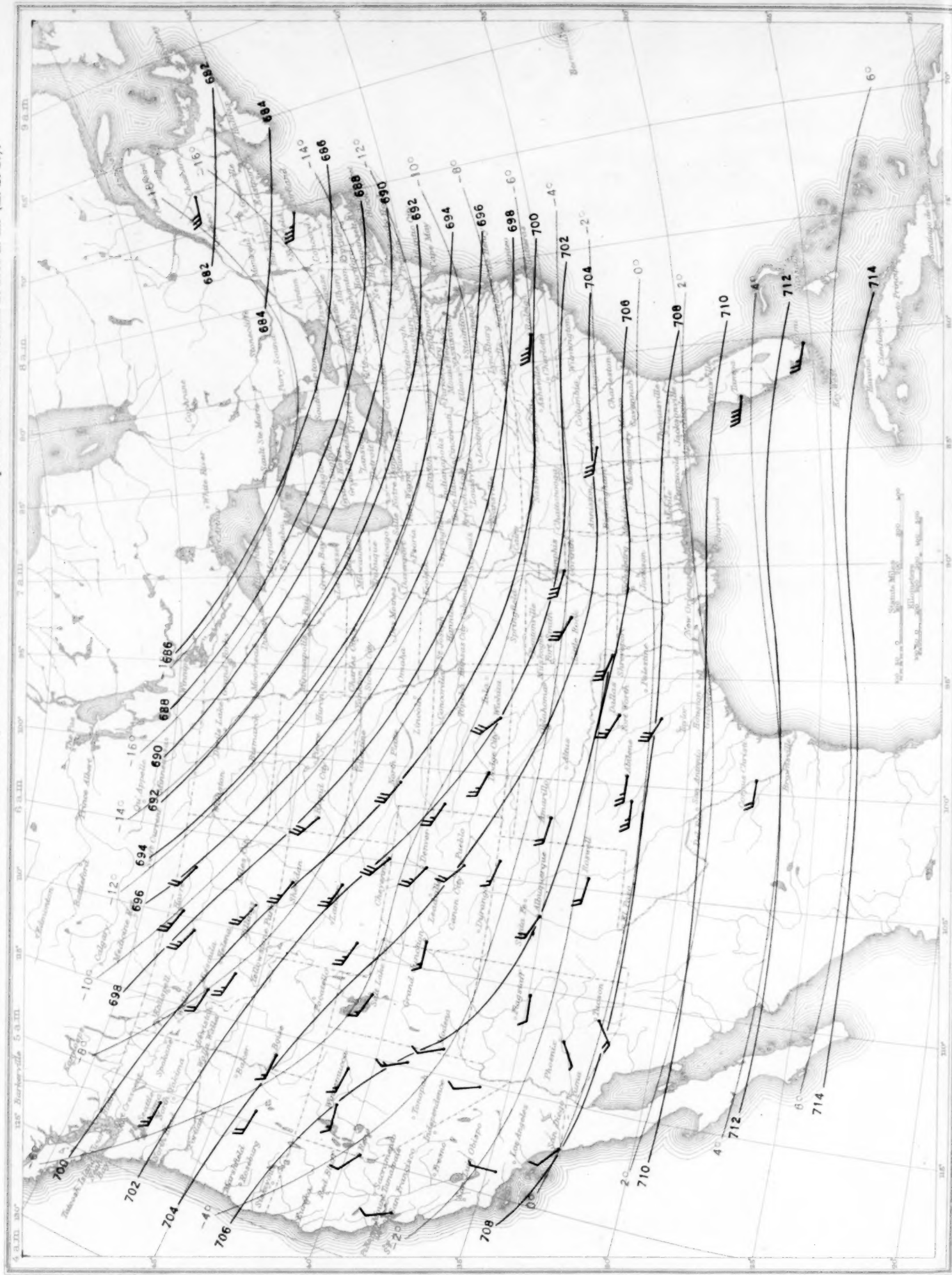


Chart X. Isobars (mb), Isotherms ($^{\circ}\text{C}$), and Resultant Winds for 5,000 Meters (m. s. l.) January 1945
 Isobars and isotherms based on radiosonde observations 11:00 p. m. at (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

Chart X. Isobars (mb), Isotherms (°C.), and Resultant Winds for 5,000 Meters (m. s. l.) January 1945
Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).

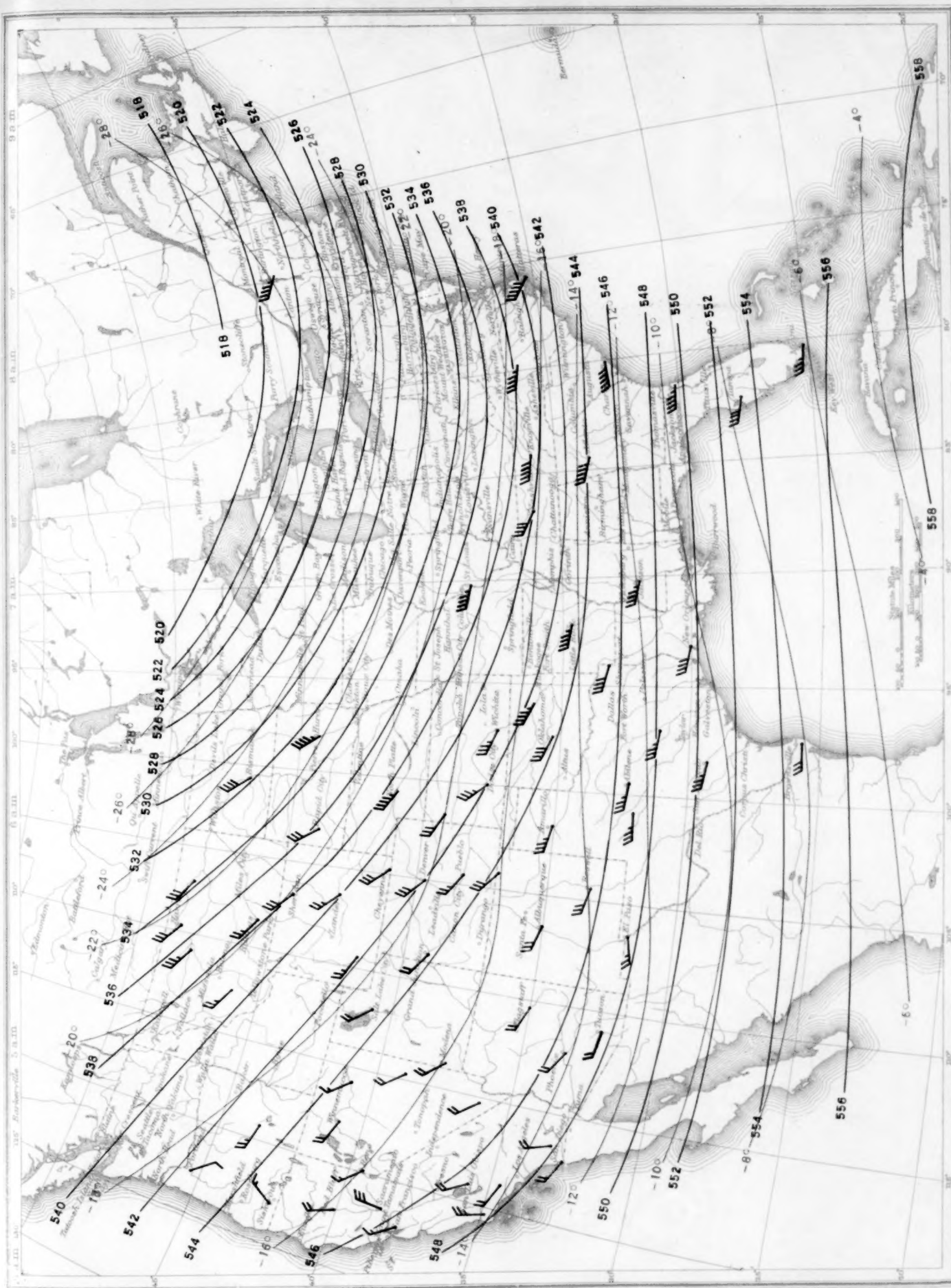


Chart XI. Isobars (mb), Isotherms ($^{\circ}\text{C}$), and Resultant Winds for 10,000 Meters (m. s. l.) January 1945
Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).

